CROP POST HARVEST PROGRAMME

Action research to evaluate the impact on livelihoods of a set of post-harvest interventions in Ghana's off-road settlements: focus on IMTs

R7575 (ZB0229)

SOCIO-ECONOMIC FINDINGS OF THE FIVE-VILLAGE STUDY

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EXECUTIVE SUMMARY (500 words)

The purpose of the project was to develop transport strategies for improving farm to market access in off-road areas, focussing on Intermediate Means of Transport (IMTs). It was to select and test a range of IMTs, mostly with women, assessing the technical, socio-economic and environmental implications of IMT adoption. Strategies were to be developed to assist IMT assessment and adoption elsewhere, including the Ghana MOFA Village Infrastructure Project. This paper focuses on the socio-economic and institutional component of the research.

The research activities took place in two districts in Central Region, Ghana, (Gomoa and Assin), where preliminary research on rural access problems in off-road settlements had already taken place (project R7149). It was hypothesised that IMTs could offer a cost-effective solution to current access problems in off-road areas, particularly for women. However, although the potential for IMTs to alleviate women's transport burden is often suggested, the difficulties and implications of adoption - in technical, socio-economic and environmental terms are largely unexplored. Hence the importance of detailed monitoring in this study.

Activities began with the identification of potential IMTs for testing in five study villages. Preparation included a technical literature review and baseline studies in each village (production levels, land tenure, farm size, food and non-food crop production, marketed output, labour inputs and time budgets, gender relations, wealth distribution/perceptions, road/path surfaces, current transport arrangements etc.) Discussions took place with district administrations, MOFA, Department of Feeder Roads, IMT suppliers, manufacturers and relevant NGOs in Ghana, and with international IMT specialists. IMTs selected had to be available at reasonable cost in Ghana and technically and culturally suited to local conditions (coastal savanna and rainforest environments, rolling topography). A range of potential IMTs were selected and displayed at 5 village workshops in October/Novermber 2000, where villagers tried out the equipment and credit arrangements were finalised. Preference was to be given to women.

Villagers elected to purchase 71 pieces of equipment through the project: 44 pushtrucks, two power tillers, 16 bicycles, 7 wheelbarrows, and 2 hand carts). A control group was identified, matched as closely as possible to the IMT group. Eighteen months of detailed monitoring of the IMT and control groups then took place (agricultural production, marketed output, IMT and conventional transport use, labour inputs, time budgets.) Broader impacts on local conventional transport services, gender relations, community path/road labour contributions, porterage, and environmental impacts were also assessed. The environmental component of the study is examined in a separate report.

A Consultative Group was established at the commencement of the project. Small studies on IMT use elsewhere in Ghana (Upper West, Kumasi and Greater Accra Region) provided useful comparative information.

Outputs of the project include: selection of appropriate IMTs for testing in the 5 off-road study villages, identification of individuals and groups for test adoption, baseline village studies, preliminary and end of project workshops with villagers, a regional-level workshop

on IMTs, and a review of recent IMT schemes elsewhere in Ghana. The principal output, however, is the assessment of the IMT trials with reference to their socio-economic, technical and environmental impacts. This report focuses on the socio-economic and institutional elements of that assessment.

The project contributes towards DFID's development goals through its focus on understanding the role of IMTs in improving food security for poor households. Improved transport through IMT availability has been hypothesized as enabling small-scale producers to add value to their harvested crops. The project results show the complexities of IMT adoption and impact, emphasising, in particular, the potentially crucial (yet questionable) role of child labour for IMT operation, the difficulties of targeting projects so that IMTs benefit women, the significance of familiarity and critical mass for IMT acceptance, and the vital importance of developing a maintenance culture and reliable credit systems.

CONTENTS

1. PRELIMINARY BACKGROUND TO THE STUDY

This background/literature review prepared as a preliminary to the commencement of R7575 considers the general significance of off-road access issues, the potential role of Intermediate Means of Transport, and their particular importance for women (with specific reference to Ghana). A full review of the IMT literature relevant to Ghana was prepared subsequently, in the early stages of R7575 and updated through the project (Porter 2003).

Off-road rural areas and populations in low income countries are characteristically markedly poorer than those in comparable roadside locations in the same region: restricted access to markets is often a serious underlying constraint to livelihood improvement (Porter 1988, 1993, 1995, 1997, 1999a,b). Remarkably little research has been carried out to discover the specific nature and extent of marketing constraints facing off-road communities and ways in which the physical (and in some cases associated cultural and institutional) constraints can be alleviated, apart from the publications referred to above, a few other studies drawing broad contrasts between conditions in off-road and roadside settlements (Barwell et al. 1985, 34-47, Ahmed and Hossain 1990), and some studies by Airey in Sierra Leone and Kenya (e.g.Airey 1985, 1985, 1992). This was the reason for initiating studies on access issues for off-road populations in coastal Ghana in Project R7149 (a short one-year project), and for taking this work forward in the current project. R7149 concluded that restricted access to markets was a serious underlying constraint to livelihood improvement, particularly for women, in the two survey districts, Gomoa and Assin, in Central Region, Ghana and suggested a multi-strand strategy for remedying the situation, with particular emphasis on the role of IMTs. The potential for IMTs to alleviate women's transport burden is often suggested but the difficulties and implications of adoption - in technical, socio-economic and environmental terms are largely unexplored.

The impact of access problems on women needs particular attention, especially in areas like coastal Ghana where they are the principal produce traders. Problems for women of living off-road appear to have received no specific attention in the literature, with the exception of work on Nigeria and Ghana by Porter (1988, 1995, 1999), though there is a growing literature on women and mobility in poor countries (e.g. Doran 1989, Bryceson and Howe 1993, Fernando 1997). In some areas road and transport deterioration has led to the decline and disappearance of off-road periodic markets, with serious consequences particularly for local women.

Many researchers have argued that road construction has a positive impact on aggregate agricultural output, with improved market access as one of the main impacts (Howe and Richards 1984, Binswanger et al. 1989, Ahmed and Hossain 1990, Platteau 1996). In looking to resolve access issues in Ghana, as elsewhere in Africa, the immediate focus of attention - particularly among off-road villagers - tends to be on roads. The construction or improvement of roads and tracks so that they are accessible by motor vehicles all year round is usually a prime development target of villages off the paved road. The most highly rated priority of villagers in Ghana is often rural roads [followed by educational needs, health and water supplies] (Crook and Manor 1998:257-). Unfortunately, it is clearly impossible to provide all rural settlements with an all-season access road.

Over the last decade or so literature on transport in sub-Saharan Africa has emphasised the need to recognise the limits to paved road construction and concentrate on lower-cost feeder

roads (e.g. Beenhakker 1987). This change in emphasis is now being reflected in roads policy in Africa, including Ghana. The 90s has thus seen a greater focus on feeder roads development. However, even where roads exist, motorised transport services are often limited and unreliable. Low rates of road utilisation by motor vehicles, as observed by Clark (1994), and by others in Ghana and elsewhere in sub-Saharan Africa, are associated with limited capital for vehicle purchases, high vehicle costs, problems in sourcing spares and short vehicle lifespan due to rapid deterioration on poor roads. IMTs are increasingly seen by donors as part of the solution to some of these problems.

Poor rural road conditions and associated high transport costs were identified as the single most important factor affecting the ability of subsistence farmers to enter the market economy in the World Bank's 'Ghana 2000 and beyond' review (1993). Crop losses due to poor roads and poor transport are common. There are important linkages between perishability, travel time and unreliable transport. Clark (1994: 161-2) notes that high risks reduce apparently generous profit margins in commodities like plantain. She observes the way drivers round Kumasi, as in Central Region, charge more on poor roads for the same distance due to slower travel and vehicle deterioration. Some villages fairly near Kumasi but on very bad roads are 'practically unable to sell fresh produce': here there are also more intermediaries involved in produce sales than would be expected in settlements fairly near a major market centre. Gore's work on pricing and marketing patterns in farm villages near Koforidua (Eastern Region) similarly suggested a strong correlation between good road access and high producer prices (Gore 1978 cited in Clark 1994:211). These are important points, also clearly emphasised through field work for R7149 in Gomoa district (Porter 1999) and earlier work in northern Nigeria (Porter 1997): it is not only in 'remote' places far from a major town that accessibility is a serious issue for farmers.

Rural Ghana was described in the World Bank's 1993 review as largely a 'footpath economy' in which human porterage prevails but brings serious (though little researched) health risks and is a massive constraint on rural labour supply, also adding substantially to both production and marketing costs. These conclusions were influential in shaping the Bank's latest major initiative in Ghana to improve access, the Village Infrastructure Project (the pilot phase of which commenced in March 1997). The appraisal report introduction notes (1.3), 'In rural Ghana, access to markets is a severe constraint for most farmers as feeder and access roads are in poor condition, with only a small percentage passable year-round. Transport constraints when combined with the inherent low capacity of on-farm storage and processing, result in high post-harvest losses ..' The scheme is targeted at empowering poor rural farmers and households (particularly women and vulnerable groups), community level institutions such as NGOs and District administrations and their staff. The rural transport component includes selective improvement of feeder roads, footpath and track access improvements and IMTs (World Bank Staff Appraisal Report 1997).

Although some initial projects to introduce IMTs have taken place in Ghana, these have mostly been focussed on the less developed north. Ellis and Hine, 1995, note that resistance to IMTs (seen as backward technology) in government departments is still often evident. The Village Infrastructure Project now offers the potential for their much wider introduction. Project R7149 looked in some detail at the (very limited) current use of, and apparent potential for, IMTs in Central Region (Porter 1999). No literature has been found specifically dealing with IMTs in this region, apart from work in R7149, and work elsewhere on their impact is as yet very limited (see below).

Bicycles are the most common IMTs in use in Ghana, though the figure of 28% ownership, among households in the 8 study villages (across 3 environmental zones) in the Ghana survey reported by Dawson and Barwell (1993:14), appears high. Ownership was certainly far lower among the off-road villages surveyed in Gomoa district in Project R7149. Bicycles tend to be owned and used mostly by men in southern Ghana but Grieco et al. (1996) suggest they would have great economic value for women petty traders. Other literature which considers bicycle use in northern Ghana points to the complexities of introducing IMTs such as bicycle trailers (e.g. Salifu 1994, Buabeng et al. 1995). The Department of Feeder Roads/United Consultancy in a 1997 report noted continued difficulties with bicycle trailers despite their acceptability to communities, notably because of lack of capital among villagers to buy bicycles plus trailers.

Work in Accra by Grieco et al. (1996) on trolleys and wheelbarrows is also relevant, though they are far more widely used in major urban centres such as Accra, than they tend to be used in rural areas of Central Region. However, in both areas they are apparently always male-operated. The reasons for this given by women and men in Accra revolve around women's lack of strength and traffic dangers, though the problem of moving a trolley while carrying a baby on the back was also mentioned. Grieco et al. suggest that it is difficult to untangle the practical difficulties women face in using the present technology from the gender stereotype linked to customary roles and division of labour. This needs further exploration.

There is particular interest among donors in promoting IMT use among women because of their low income and often (associated) restricted access to motorised transport, and the tendency for men to be the owners of IMTs and the main beneficiaries of IMT schemes (Bryceson and Howe 1993). In R7149 ownership of IMTs among women was found to be extremely low. It is important to recognise the links between acquisition of certain goods and status.

There is very little data as yet on the impact of low-cost transport on women and Doran makes the point that, in looking to improve conditions through transport and non-transport interventions, it is important to consult women themselves. Moreover, innovative forms of transport have to be demonstrated so that people can see their usefulness (Doran 1990:39): pilot projects will need to be established more widely - and credit schemes put in place - if uptake is to be rapid. This may be particularly important in off-road contexts, since populations here are arguably less regularly exposed to new experiences and practices and the conservative influence of customary authority patterns is greater (Platteau 1996).

Like many writers in this field Doran (1990) observes the enormous difficulty women have in accessing credit and thus suggests that transport interventions must consider the possibility of subsidising low-cost transport (a theme taken up by John Hine in a DFID transport workshop in March 1999). This may well be a more realistic approach than group purchase of vehicles. The issue of group ownership is certainly one which needs much more careful consideration in view of the popularity of group initiatives among donors. Group transport schemes have reportedly had limited success in northern Ghana because loans were very difficult to recover (Feeder Roads/United Consultancy 1997). Dawson and Barwell (1993:50) suggest that maintenance is a problem with group ownership unless arrangements and responsibilities are clearly established. It will be important to explore the dynamics of group versus individual ownership of IMTs, given the potential conflicts arising out of joint

ventures (an issue also raised by people in the survey villages during discussions in project R7149).

The Village Infrastructure Project envisages IMTs being made available to groups such as farmers' associations (World Bank 1997). There is clearly a need for careful monitoring of group schemes and comparison with individual ownership of IMTs (which this project would allow). Aryeetey and Appiah (1995) make the point that the success of groups seems to be very dependent on 'the extent to which prevailing local norms and values regarding group formation and action are taken into account'. A detailed review of issues surrounding group enterprise and ownership and associated issues of trust is provided in R7149 (Lyon 1999).

Introduction of IMTs has implications for path/road maintenance and improvement and also associated environmental implications. (Apart from some work assessing environmental impacts of unmetalled roads on fluvial systems in Asia, detailed work on the environmental impact of IMTs has yet to be undertaken). Road maintenance by villages in the Gomoa and Assin survey areas tends to stop once roads are improved/maintained by the Department of Feeder Roads. R7149 showed that paths in the study villages were maintained by villagers. Use of IMTs on village paths could require some path widening which would raise issues of compensation to landowners and dangers of loss of a sense of path/track 'ownership' if viewed as an external intervention. Airey and Wattam (1998), considering the potential for community participation in secondary and feeder road maintenance in East Africa**,** reviewed current literature on this theme and conclude that lack of a sense of ownership of public infrastructure among villagers and lack of end-user participation in the planning process is common. Their experience in 3 case studies was that once government or any agency improves a road, its maintenance becomes the responsibility of the agency, as far as villagers are concerned. Other factors influencing participation include the strength of the village council or committee organising maintenance and the time of year when maintenance is conducted. Frequently, there are perceived problems of 'free-riders' who use the improved roads but do not contribute to their upkeep (Ostrom et al. 1993). It was thus recognised that R7575 would need to pay attention to and further explore these path/road issues.

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2. PROJECT LOCATION: DISTRICT AND VILLAGE CONTEXTS

This project focuses on just two districts in Ghana's Central Region, one in a coastal savanna region (Gomoa district), one in a rain forest area (Assin district). However, the aim of the project is to suggest methodologies and strategies which can be tested elsewhere in Ghana and other sub-Saharan countries.

2.1 Introduction: choice of the two districts and five study villages

The two districts and five study villages were those which formed the focus of our market access research in R7149. Greater background detail is provided on the Gomoa settlements, because these formed the main focus of our research.

This section draws on information collected in R7149 and the R7575 baseline surveys. ***It describes conditions at the time the project started in 2000.*** The first village in Gomoa, Gomoa-Lome, is described in considerable detail. Variations from the Lome pattern are then highlighted in subsequent village summaries. Particular attention is paid to transport and related labour issues in the discussion. The Gomoa village descriptions draw on baseline data from R7149 and additional material prepared by Frank Owusu Acheampong for his (linked) MA thesis.

2.2 Gomoa district

Gomoa district, in Central Region, is one of Ghana's poorest coastal districts (Hewawasam et al. 1996). It was created out of Effutu-Ewutu-Senya district when the current decentralisation programme started in 1988 and is the second largest district in the region. Gomoa is located very largely in the coastal savanna belt; the climate is characterised principally by a bimodal rainfall distribution and a mean annual rainfall of between 70 and 90 cm along the coast, and 90 to 110 cm in the northernmost area where savanna gives way to semi-deciduous forest. The topography is gently rolling, mostly under c. 350 feet, but with occasional hills of up to c. 750 feet. Settlements are generally nucleated.

Gomoa is principally an agricultural district and the main crops grown are maize (often the major cash crop), cassava (grown both as a food crop and, generally to a lesser extent, as a cash crop), peppers and tomatoes (both the latter grown as cash crops and, in the case of green pepper, sometimes as an export crop). Maize occupies the largest acreage according to the District Development Plan (May 1996) but yields are below the national average (Young 1998). The Development Plan refers to the high potential for grain production and the development of large-scale export production of pineapples and pepper. However, current constraints are reported in the Plan as unreliable rainfall, lack of credit for farmers, fluctuation in agricultural prices, high input costs and poor roads.

Labour shortage is also a problem in many areas: youths have migrated out of Gomoa to the forest zone where they are engaged in cash crop cultivation. This can be linked to the currently limited agricultural production in Gomoa and suggests a vicious circle whereby labour migration is encouraged by the relatively underdeveloped state of agriculture and labour shortages help perpetuate low productivity. Communal labour parties (nnoboa) for agricultural work are still common in this area and a bush-fallowing cultivation system without the use of any fertiliser is widespread. An estimated 16% of the active labour force in the district migrate regularly to the forest zone to cultivate

cash crops (Young 1998). Time savings from increased transport efficiency could arguably have a substantial impact on agricultural productivity. On the basis that a headload typically weighs around 30 kg., and that yield is around 10,000 kg per ha for cassava and 1,900 kg per ha for maize, estimates suggest it takes 167 person-days to load one acre of cassava from farm to village, and 32 person-days per acre of maize (Riverson and Carapetis 1991:6).

While farming is undertaken by most men and women in rural Gomoa (even in coastal settlements), men tend to have primary access to land, and farm more extensively than women. Women are the principal agricultural produce traders, however, travelling extensively both within and outside the district to market their own and their husbands' produce and returning home with other items which have been purchased for resale in their village area. In addition to trading, most women are involved in farming (sometimes on their own account, sometimes in conjunction with their husband) and a host of household activities including water and fuelwood headloading for domestic use and the headloading of most of their own and their husband's produce from the fields to the village. Fieldwork in R7149 indicated that the majority of loads carried are relatively small, with most loads transported on most trips being below 25kg. Field work in R7575 provides more detail on load carrying (see section xxxx below),

Four villages located off the paved road in 1999 were selected for detailed study: Adabra (8 km from the paved road), Lome (4.5 km from the paved road), Sampa (8 km from the paved road) and Abora (3 km from the paved road until 2000, when a tarred road was constructed to the village). All are primarily Fanti villages, though stranger farmers from other parts of Ghana (notably Ewe from Volta Region) are also resident in each of the villages.

2.2.1 Gomoa-Lome

Lome is the largest of the study villages in Gomoa district. It is located to the north of the Accra Cape Coast road and 4.5 km from the main Apam – Swedru road. It has a population of about 2000 and appears to be the wealthiest of all the study villages. This is reflected in the the quality of house construction: block, bricks or mud, roofed with corrugated iron sheet. Maize cribs are found behind or inside some houses. The inhabitants are mainly Fantis with very small proportions of other ethnic groups. Christianity is the dominant religion, followed by Islam.

The social structure of the village is firmly hierarchical with the stool (chief, queen and village elders) at the top and the seven clans of the Akan customary system underneath. Land for farming, construction and other purposes is owned and controlled by the clans. However, some extended families are assigned portions of land to farm and this is passed on from one generation to another. Some clans also have common tree crop farms, especially cocoa, commonly started by one of their elders in the past.

Land allocation and tenure in Lome: Farming is the main economic activity of the village. Land allocation for farming is done by each clan head independently. The clans hire the lands out to non-clan members to generate income to support their activities. Some members within clans are given portions of land to farm. However, members who want larger plots have to pay for the additional land. A block form of bush fallowing is practiced on some of the more distant lands used for the cultivation of maize. Fallowing is managed by the clan heads (clan landlords). This can greatly influence farmers'

choice of land and use of transport facilities. The implications are that farmers may have to vacate more accessible plots for less accessible ones or vice versa. Also portions of routes to the fallow land may fall into disuse if these routes do not lead on to lands in use even further away and new routes will have to be reconstructed when the land is subsequently reopened for farming. Movements to new plots at different locations may require the construction of new routes.

Cash payment and free use are the commonest form of tenure: 49.5% and 38.5% of all farms surveyed in the baseline study were under free use and cash rent respectively. More women (64%) have free access to land than men (38%) even though both have equal access to clan lands (baseline survey 2000). The reason is that some women use land that has been obtained free by their husbands. Land is readily available, but its cost and the cost of related farm inputs, including labour, place a limitation on how much people cultivate. The cost of land is dependent on the distance and maturation period of the crop to be planted. Plots at more distant locations are used for maize production and the prices of these plots are often one-third to half the price of lands used for the production of cassava, vegetables, other annuals and mixed cropping. Those who produce cash crops with longer maturation periods (over 3 years) usually hold land under a mixed system of tenure. The farmer pays cash for the first year only and the remaining years are free. The farmer either keeps all the food crops or takes two-thirds and gives a third to the landlord (*abusa*) or the main cash crop is shared into two (*abunu*). Men predominate in these types of tenure since they cultivate most tree crops. Such agreements are usually made through negotiations between landlords and tenants. The landlord may be the clan head or a member of a clan who has been assigned that land to farm on long term basis.

Farm labour in Lome: Labour is an important factor in the farming system of the village since production is not mechanized. Labour is required for farm activities such as initial land preparation, planting, weeding, harvesting and evacuation of produce. Labour is available but there are often temporary shortages during the land preparation, planting and harvesting periods. Farm labour consists principally of either family members or hired labour. The form of labour chosen (paid or free) is determined by the relative availability of the two forms of labour, cost of hiring, cash availability and the quantity and type of job to be done. Both men and women prefer family labour since it is often free or (sometimes) paid for by a gift in kind. Family labour usually comprises the farmer, his spouse, their children and sometimes other members of the extended family.

A loose division of labour exists in the farming system with men engaging in initial land clearing, felling of trees and some reweeding whilst women are commonly plant, reweed, harvest and carry produce. Spouses usually help each other on their farms, with men doing the initial land clearance for their wives whilst the women then plant and carry produce from their husband's fields as well as their own. When female family labour is not available men tend to hire porters or solicit help from other women in the village for portering tasks. Male participation in the headloading of produce is very limited. Female farmers tend to employ male labour for initial clearing when male family labour is not available.

Cropping patterns: The bimodal rainfall pattern supports two cropping seasons per annum (the major season, planted in March to May and the minor season, planted in September to October). Maize and cassava are the major crops grown. Other crops

include plantain, cocoyam, and vegetables such as pepper, tomato and garden eggs and long maturing cash crops such as cashew, oil palm and citrus. The minor season farms are mainly used for maize and some cassava and a few vegetables. Men usually cultivate single stand maize and other cash crops with long maturation periods (cashew, oil palm and citrus) whilst women often make mixed (intercropped) maize, cassava and vegetable farms. Most women who plant tree crops are those who farm jointly with their husbands. The production of tree crops is capital intensive and may require cash payments for land, seedlings, labour and fertilizer. Men are usually in a stronger financial position to afford these.

Farm size and location in Lome: Both men and women make relatively large farms by Gomoa standards, some of which exceed 15 poles (baseline survey 2000). On average, men make bigger farms than women, probably due both to men's ability to clear larger plots and the fact that men need to generate more income from their farms to support the family. Most produce from the women's farms goes directly for family consumption. Maize farms are the largest and the farthest from the village: some are 6 -7 km distant and encourage the creation of temporary settlements where farmers stay at peak labour input points (land preparation, planting and harvesting). The duration of stay at such settlements differs but can be as long as 3 months.

Given the bulky nature of maize, evacuation of the crop poses a huge transport task, creating massive labour demands in the maize harvesting season. This creates a labour shortage which compels some people to store maize on cribs at their farms or in the temporary settlements. This allows farmers to store maize until such time as labour becomes more available for headloading and the maize is needed for sale or for consumption. About 40% of respondents store maize at their farm at least for some part of the year: some are reluctant to leave it there because of an increasing threat of theft.

Cassava, vegetable and tree crops are grown closer to the village, in the case of cassava because it is very bulky and in the case of vegetables because of their perishability.

Farm distribution: Most men and women have more than one farm and these are often not contiguous. Only 2.2% out of the total respondents in the baseline survey owned just one farm. Most farms (72%) are within a distance of 1.1 to 4 km from the village. However, the separate farms of an individual may be at entirely different locations of the village, making it difficult to make a single trip round all the farms, especially on foot. The more distant farms, the temporary settlements and the major foot paths to farms are located to the north of the village.

Most farms are accessible by foot paths and on many of these paths there are physical barriers such as unbridged streams, seasonally muddy and flooded spots and some low isolated hills. Most of the foot paths are too narrow to accommodate four-wheeled transport devices while streams and and flooding present additional barriers. The distribution of farms, farm routes and some of the barriers are shown in map form in Appendix 1.

Farm-related transport tasks in Lome: Agricultural transport tasks includes taking planting materials and other inputs to the farm and evacuating produce after harvest to the granaries or directly to market. Planting materials include cassava stem cuttings, plantain suckers, seed maize, vegetable seeds and seedlings of tree crops. The cassava

sticks, plantain suckers and tree crop seedlings are bulky and therefore may present a substantial transport task if they have to be moved long distances between old and new fields. Most bulky planting materials have to be conveyed along narrow footpaths. The main sources of planting materials are farmers' own stock, friends, relatives, the District Agricultural Extension Office and ADRA (an NGO): i.e. they are obtained locally. Fertiliser is not commonly applied: small amounts obtained from ADRA are used mainly on tree crops.

Head porterage is the major means for carting loads both from farm to village and village to farm. Headloading is mostly done by women, though men usually assist in the major maize harvest. Women will carry produce from both their own and their husbands' farms. Men hire porters more often than women because they have more funds to do so. The principal task pf paid porters is carrying maize from more distant farms into the village. These porters are mainly women and they are paid in cash or in kind. Other people, especially women and children who are not specialized porters, may also assist their neighbours. Male assistance is done on a cooperative labour *nnoboa* basis, whereas women and children assistants are given portions of the produce they carried. A few farmers also hire trotro or *motor* trucks to convey their maize from distant farms to the village during the main harvest. This is only possible along a small number of broader tracks or roads. In most instances these motorable routes are 2 -3 times longer than the direct foot paths to the farms. Transport charges along such routes are usually higher than along standard unpaved village roads and few people with farms in such locations can afford to use them.

*Transport implications of off-farm occupations: T*rading is the next most important activity in Lome after farming and is usually undertaken by women. Some processing activities such as gari, palm oil and kenkey production are also carried out by women while men may engage in hunting, construction and carpentry in addition to farming. All processing activities take place at the village since there are grinding mills within the village. However, women may travel to Dawurampong market 3 kms away to sell the processed food. In addition, women sell their husbands' produce, especially maize and cassava, either at the Dawurampong market or at the village. Such trips to market are usually made by taxi or *trotro* or on foot. Men's construction and hunting activities also involve carrying materials or game either within the village or between the village and other settlements: this tends to involve headloading in the case of local journeys, tro-tro or taxi where more distant travel is required. Some men from the village migrate temporarily to Eastern, Western and Greater Accra regions during the off-farm season (October to January) to work as farm or construction labourers.

Transport implications of access to fuelwood and water supplies: People obtain fuelwood from their farms or the open bush. It is usually conveyed to the village by head porterage. A small number of women sell fuelwood in the village and a few men burn and sell charcoal, either at the village or at Dawurampong market. The main sources of water are ponds, wells at the immediate outskirts of the village and stand pipes within the village (which flow from time to time). There are about 6 stand pipes at various locations (homes and open places) where people queue to buy water. Water is carried mainly by children and women. In the dry season, people may queue by wells or stand pipes for about 3 hours for water or travel a distance of about 5 km by *trotro* or taxi to obtain water from nearby villages. Thus in the dry season, there is a relatively high demand for transport for carting water.

Access to credit, education, health and other essential services:. People obtain credit from a few wealthy private individuals in Lome and nearby villages, but the interest is very high. Loans are given out at the planting season. Repayment, in cash or in kind (produce) is usually made at harvest. A small group of 18 people (15 men and 3 women) obtained a loan from a bank in Swedru in 1998 but some members defaulted and so did not get any credit in the ensuing years. The nearest banking facilities are located at Dewurampong, but few residents have a bank account.

There is a nursery, primary and junior secondary school at the village, though a few children travel to a private primary school in a distant village: they can only travel there when transport is available in the village (and thus tend to go to school only 3 days each week!) Three grinding mills are located within the village. People travel a distance of about 23 km or more to obtain medical care at Swedru or Apam. However, for minor ailments, some use the clinic at Dawurampong 5 kms away. Inter-village trips for all these services are mostly made by *trotro* or taxi on market days. The transport costs further increases the cost of the services.

Road conditions: Three roads lead to Lome village (see Appendix 1). All three roads are unpaved and in a poor state but the main road leading to Nduem is relatively better and thus the most used. The Nduem road is graded about once every one to three years. The other two roads to Oguan and Abonko have not been graded in recent years and by the start of our project had become impassable. A bridge on the Oguan road had collapsed, making it impossible for vehicles to pass this point. Deep gullies were present on the Abonko road with a section at the immediate outskirt of Lome becoming flooded after every rain storm. No vehicles used these two roads. Organised communal labour is used to weed the sides of the roads and fill potholes during the January and August Festivals. Men do the weeding and fill potholes with gravels and stones collected by the women.

Market access and pattern of trade: The main market serving the village is at Dawurampong, a small town of about 4000 people, about 5.5 km from Lome on the paved road between Swedru and Apam. Lome people travel to the market by taxis or *trotro*. Most of these vehicles come from Dawuampong together with a few from Swedru. It is easier to obtain transport from Lome to market at the peak harvest seasons than in the off-season. It is also easier to get transport on market days than on non-market days.

Much of the maize produced by farmers at the village is sold within the village to resident or itinerant traders. This saves farmers the time and cost of traveling to the market; also, they are more likely to be able to afford to keep their produce if they do not find a buyer until the next market day, since they will not have to pay the transport costs of bringing the maize home. Some wealthy villagers, both men and women, purchase maize from other local farmers during the harvesting period and resell in the lean season at the village or at external markets.

Other crops such as pepper, tomato, garden eggs and palm nuts are sold at the village market when the quantity is small and at Dawurampong market when the quantity is large. Cassava is sometimes sold as it stands in the field. This saves farmers the time and cost of harvesting and headloading the produce to the village or to the market. Traders in this case bring in their own labour.

Few people sell their produce at the major market town of Swedru due to the relatively long distance (about 23 km) and the additional transport charges involved.

Transport Charges
Transport charges differ between taxis and *trotros*. Taxis are slightly more expensive. Transport charges for loads are not fixed but the people at the village generally complain that they are expensive. Very few vehicles visit the village and this has given the drivers the power to charge whatever they please. The drivers and passengers will bargain but the drivers usually have the final word. There was no vehicle based at this village at the time of the baseline survey though there were about 10 bicycles, all owned by men.

2.2.2 Gomoa-Abora
Abora is the smallest of the four study villages. It is located 3.3 km south of the Accra – Cape Coast road and about 5 km from the coast. It has a population of about 260 (nearly 60% of whom are female). A high proportion of the population is elderly: there are relatively few children. The inhabitants are mainly Fantis, a large proportion of whom belongs to one clan. Only the dominant clan has elders and it is from this clan that the chief and queen mother are selected. Activities are organized mainly at the communal level. Christianity is the dominant religion of the village. There is high temporary and permanent out-migration of youths, especially males, both to urban centres and to places with greater agricultural potential. This has created labour shortages at the village. Abora is a poor village with the depth of poverty indicated by the type and state of its buildings, very few of which are plastered. Most of the buildings are in a dilapidated state and some are near collapse. Beside or within some compounds there are cribs for storing maize.

Land allocation and tenure in Abora: All land in the village is owned by the community and controlled by the chief and his elders. All respondents surveyed indicated their land ownership as family or communal. Cash payments and sharecropping are totally non-existant in the farming system in Abora. This free access to land is an important advantage, particularly since both men and women have equal access to land. Some families within the village have farmed at particular locations over several decades and such plots are passed on from one generation to another and are virtually seen as family land. People simply pay a bottle of schnapps to the chief and his elders to gain access to any piece of land, whatever its size. Once the 'dash' is paid, an individual can farm on the land as long as s/he wants. An additional bottle is required only when individuals want to move to land at an entirely different location. This allows people to keep all their separate farms at one location for several years.

Farm Labour in Abora:. In most instances men do the initial clearing and re-weeding whilst women do the planting, some re-weeding, harvesting and headloading of produce. However, men and women's roles are not mutually exclusive. Especially in families where husbands and wives make separate farms, each of them may be found performing all these tasks. Children follow a similar gender division of labour.

Villagers mostly depend on family labour and smaller amounts of hired labour. Labour is very scarce and expensive here, in part due to the high average age of the inhabitants. This high cost, coupled with the high level of poverty, means few people can afford to

hire labour. This has contributed to the smaller farm sizes, especially among the elderly women, most of whose children have migrated from the village. People who hire labour, especially women, do so mainly for the initial clearing which is a particularly strenuous task. In some years women who need assistance have to obtain it from nearby settlements. Communal labour is available occasionally for planting, harvesting and headloading maize.

Cropping pattern at Abora: The major crop cultivated by both men and women is maize, followed by cassava and vegetables in that order. Men produce more maize than women, whereas women produce more vegetables and cassava than men. Maize serves as both a food and cash crop. It is stored in cribs in the village and occasionally at the farm. Cashew and oil palm are the main perennial crops. The production of tree crops is relatively recent and only the chief, so far, has started harvesting palm nuts. Inter cropping is practiced widely, though there are occasional pure stands of maize and pepper.

Farming is mainly rainfed. The area has a bimodal pattern of rainfall which, in theory, supports two cropping seasons per annum. However, the rain is very unreliable and the minor season rains are often scanty, restricting most farmers to one crop per annum. This contributes to the low agricultural productivity at the village and leaves little or no food surplus to be sold by farmers. The production of such common foodstuffs as plantain, cocoyam and yam is not favoured by the low rainfall. Many people, especially women, resort to cutting and selling fuelwood for their livelihoods. The transport implications of this activity are discussed later in this section.

Farm size and location in Abora: Farming is the main economic activity at Abora, which has relatively high land availability per capita by Gomoa standards. Unfortunately, most land to the south of the village is composed of black cotton soil which is not suitable for crop production under current techniques, given the low rainfall of this area. Nonetheless, there is still enough land available for all those willing to farm. Farming is concentrated on a few routes which lead to most farms and are thus easier to maintain. Most paths are weeded by those men and women who need to use them to access their farms.

Separate farms belonging to the same individual are usually not farther than half a kilometer from each other. Most men and women at the village own few separate farms. About 75% of all villagers had only one or two separate farms at the time of the baseline survey. It is thus easier for Abora farmers to make a single trip round all their farms than those at Lome, since their farms are fewer and closer to one another. This makes the carrying of produce easier. Loads from separate nearby farms could be amalgamated and a relatively larger transport device used for a single trip.

Total farm size per person is also small by comparison with Lome: 90% of all respondents in the baseline survey had a total farm size not exceeding 4 poles. Men usually make bigger farms than women. The smaller farm sizes in Abora imply smaller loads per person compared with Lome. Distances from the village to the farms are not great. About 90% of all separate farms owned by respondents are within 2 km distance of the village. This, together with the other accessibility factors, makes the farm transport burden relatively small at Abora, by comparison with Lome. Almost all villagers store their maize in the village since their farms are only a short distance away.

Farm-related transport tasks in Abora: At the time of the baseline survey almost all inputs and produce were conveyed from farm to village and village to farm by head loading. Almost all farms have access only by narrow weedy paths, with the exception of those located on the path that connects Abora to Brofoyedur village. Some of the farms are located on hills.

Both men and women usually use seed maize and cassava sticks from their own stock, from friends or relatives. Whereas seed maize is usually taken from the house, cassava sticks are taken from the old field to the new field to be planted. The bulky nature of the sticks poses a major transport burden in instances when the source field is far from the destination. Vegetable seeds or seedlings are either bought from the market or obtained in the village. People usually do not make a separate trip to buy such seeds or seedlings but use the opportunity to buy whenever they take produce or fuelwood to Apam market. The tree crop seedlings were all obtained from ADRA.

At harvest, women and children carried most produce, with men assisting only in carrying maize. The participation of children in maize porterage is often even more substantial than that by women. During the major maize harvesting season in August-September, men and women assist one another to carry maize from farm to village, the order based on whoever harvests his/her maize first. This reduces loss and spoilage from rodents, unexpected rains or pilfering.

Transport implications of off-farm activities: Trading is the second major income generating activity after farming in Abora. Fuelwood is the major commodity traded by the inhabitants, especially women. This is the most demanding transport activity in the village and is undertaken mostly by women and children. Men who participate from time to time make their trips before dawn, in order not to be seen by others. Other men also assemble their fuelwood at the village and call traders from Apam or Ankamu to come and buy at the village. A number of people also sell charcoal, pestles and fish smoking sticks at nearby towns (Apam and to a lesser extent Ankamu and other towns). All trips directly to Apam are on foot along a foot path (there is no direct motorable route). Individuals may make up to 5 trips per week over a distance of 5 km or more (single journey) with heavy loads of firewood or pestles etc.

Some women buy and sell other commodities such as fish, gari, bread, and salt. These are brought from Apam when people are returning from their fuelwood selling expeditions. Only two female traders make special trips to distant markets such as Mankessim and Kasoa to buy goods for sale in the village. These specialized traders always have to hire a taxi from the main road junction at Ankamu to the village when returning from their trip. A few women (about 5) also engage in the preparation and selling of kenkey, which requires them to travel to Ankamu, a distance of 3.3 km, to grind their maize. Some men earn substantial sums of money through hunting game. The game is usually head loaded or conveyed by bicycle to Ankamu or the Accra – Cape Coast roadside for sale. (Hunting proceeds have allowed a few men to purchase cycles.)

Transport implications of access to fuelwood and water supplies: The main source of fuelwood for both domestic consumption and sale is farmland and the open bush. Both men and women and sometimes children assemble fuelwood during the land preparation

period (sold later, when it has dried). Some men and women also burn wood for charcoal to sell. After the planting season, women and children enter the open bush to cut trees for fuelwood, pestles and fish smoking sticks. Some travel up to about 4 -5 km in search of fuelwood. All wood and charcoal is brought to the village by head loading for subsequent onward transport to market. Hunting for fuelwood can take up to 8 hours per day and thus reduces the time available for farm work.

The main sources of water in the village are dry in the dry season. People, mostly women and children, therefore have to make c. 2 – 4 trips daily over a 4 km distance (one way) to the nearest village to obtain water in the dry season. Though the trip is along an unpaved road, vehicles rarely pass along it because the road ends at Abora.

Access to credit, education, health and other essential services: Access to credit is very limited in Abora. A few people –mostly outsiders- give credit in some production seasons to farmers. The credit is mostly used for farming and occasionally also for consumption. Credit is repaid with maize after harvest: the interest rate could be over 100%, depending on the price of maize at the time of repayment. There are banking facilities at Apam, the district headquarters, but very few people in Abora (about 5) have bank accounts.

There is no school at the main village so children have to travel on foot 2 km to the new site, or to other villages. (They also have to travel 3.3 km to grind maize and other foodstuffs.) The nearest health centre is Apam, a distance of 5 km by foot along the most direct access (foot path).

*Road conditions:*Abora is served by one main access road which links it to the main Accra – Cape Coast road at Ankamu (Apam Junction, Fig 3). The road is 3.3 km long. The condition of the road at the time of the baseline survey was very poor: it had not been graded for well over 5 years. Some drivers were consequently unwilling to visit the village. A section of the road becomes flooded and muddy after rains, at times blocking vehicle access to the village for one to two weeks. This flooded section is said to have blocked the access of a company vehicle that used to visit the village to buy pepper for export. This forced the villagers to headload their produce to the main Apam Junction for sale to the company.

All other access routes to the nearest settlements are foot paths. Abora is 4.8 km from Apam, the main market centre and the district capital. The most direct access route to the market is a foot path which gets very slippery in the wet season. The other major foot path which links Abora to Brofoyedur village is about 3.4 km. The men of the village use communal labour to weed these major foot paths and the main road to the junction prior to their festivals in January and August. As in Lome, women assist by carting stones to be used in filling potholes.

Market access and transport costs: There are no regular transport services into the village. People traveling to the village by road either have to walk or hire a taxi at a cost of 4 – 5000 cedis per single journey. People with large loads to be conveyed to the junction have to go there and hire a vehicle. One woman trader owns an old taxi but this is based at the nearest paved road. In addition, there are just 3 people who own bicycles, two of which are broken. Access to market is mainly on foot. People visit the market at Apam on Tuesdays, Fridays and Sundays. The main commodity sold is fuelwood.

2.2.3 Gomoa-Sampa

Sampa is the second largest of the study villages. It is about 7 km from the main Accra – Cape Coast road. Sampa has a population of about 1100 people, occupying about 120 houses. The houses are built of blocks, bricks or mud and roofed with corrugated iron sheets, an indication that poverty is not as widespread as in Abora. Some people have made cribs inside and at the back of their compounds for storing maize and other produce. Most inhabitants are Fantis with very few people of other ethnic backgrounds. The major religion is Christianity with only a few Muslims and 'traditionalists'. All seven different clans are represented in the village but their numbers differ greatly. Each clan has its elder but clan activities are not as pronounced as in Lome. Activities are often organized at the communal level with little or no clan representation. The majority of land at the village is owned and controlled by various clans and smaller proportions by the stool and a few individuals. The stool land is a piece of land set aside by the entire community for use by the chief and queen mother or to hired out to generate income for the chief, queen or the community as a whole.

Land allocation and tenure in Sampa: Farming is the main economic activity at Sampa. People either use family land or rent land from other sources. Whenever family land is available people prefer to use it, since they are not charged or charged very little for using it. The family land in this case may belong to the clan or the extended family. Of the total of 42 plots surveyed in 2000, 40% were family land whereas 57% were rented.

Land tenure includes freehold, cash renting and sharecropping. There is an equal number of plots under cash rent, sharecropping and free hold (33.3% each). A few people pay rent for using family lands but the rent is far smaller than that paid by non-family members. Land rent rates vary across the village. Both men and women have equal access to family lands and there is no significant difference in the tenure arrangements between males and females.

Farm labour in Sampa: Labour utilized may be either family or hired. Farm labour is not so scarce in Sampa compared to the other villages, though shortages sometimes occur in the land preparation, planting and harvesting season. People assist one another in the carrying of maize during the main harvesting period. Hiring of labour is common for initial clearing and bulk harvesting which are particularly strenuous tasks. Communal labour is available occasionally for planting, harvesting and carrying maize. As in Lome and Abora, farm tasks tender to be allocated according to gender.

Cropping patterns: Maize and cassava are the most important cash crops and the major staples in Sampa. Other food crops are plantain and cocoyam while oil palm, citrus and sugar cane are grown as cash crops. Pepper is the most important vegetable for both consumption and commercial purposes. Other major vegetables are tomato and garden eggs. Intercropping is widely practiced though men sometimes grow single stand maize or cassava.

The village has a bimodal rainfall pattern which supports both major and minor season cropping. However, the major season farms are usually bigger and exhibit greater crop diversity. The minor season farms are mostly for maize and cassava and possibly a few vegetables.

Farm size and location in Sampa: Most people in Sampa have a number of farms: this may be due in part to the fact that many people at the village farm jointly with their spouse. Separate plots are usually no bigger than those in Lome, but total farm size is usually bigger. No single farm exceeds 4 poles but 92% of respondents have a total farm area exceeding 4 poles. The small size of the individual farms means that transported loads per plot are likely to be small. The separate farms of individual families are often widely separated and some are very far apart, making a single round trip to all farms difficult: this is especially the case for farms located on the other side of the river which cut across Sampa village lands. Thus people are forced to make separate trips to individual farms to convey relatively small loads. This would not make the use of larger capacity transport equipment economical unless loads were amalgamated with those of other farmers.

Farm distribution: Most farms (81%) are more than 1 km from the village. 26% of all plots surveyed in the baseline survey were within 1.1 to 2 km radius, 48% within a distance of 2.1 to 4 km and 7% within 4.1 to 8 km radius from the village. Farms owned by women tend to be closer to the village than those owned by men. Thus while 61% of male respondents have farms beyond 2 km from the village, only 39% of female respondents' plots are over 2 km away. The separate farms of an individual may be at entirely different locations. The longer farm distances make evacuation of produce difficult. In addition, the separate farms at different locations make it more difficult to make a single round trip to all farms. Unlike Lome, there are is no clear locational zoning by crop type.

Farm-related transport tasks in Sampa: Head porterage is the major means of transporting inputs to the fields and farm produce to the village. This is mostly done by women and children, though men occasionally assist, notably during the maize harvest. Planting inputs are mostly locally obtained from farmers' own stocks or from friends and relatives. A few people occasionally purchase inputs from others within the village or in the open market and a handful of people also obtain improved seed maize and fertilizer from ADRA. Cassava sticks, oil palm and citrus seedlings are all bulky inputs which represent a substantial burden when transporting them to the farm. At harvest friends and relatives assist one another in transporting maize and sometimes cassava. Porters are available at the village but are hired by people mostly for carrying building materials such as sand and stones. Only orange and sugar cane traders based at the village or outside the village hire porters for carrying produce from farms to the roadside or village.

Most farms are accessible either mainly by foot paths or by a combination of foot path and road. Paths are maintained by those with farms along that route. There are various physical barriers on the foot paths such as unbridged streams, muddy spots, and hilly spots. The most fertile land in the village area is behind the Okye River, about 4 km or more from the village centre. However, in the wet season (March – June and September – November) the river valley becomes flooded and the river can be crossed only with a small raft made by one of the local farmers. This severely impedes access to this land. Many of those who farm beyond the river are fearful of using the raft and take a detour through Gomoa Brofo, doubling the length of the journey. When loads have to be carried to and from these farms, the burden of these lengthy journeys is particularly great.

There is a small market inside the village where people retail produce in small quantities. There are two grinding mills at the village but neither has a cassava grater. Gari processors therefore have to travel to Ohua, a village of about 5 km along a footpath from Sampa to bring in a mobile grater to grate cassava. The grater is usually dismantled and headloaded by the operator and the person requesting the service.

Transport implications of off-farm occupations: There is no major economic activity besides farming in Sampa. A few women undertake trading and food processing activities such as gari, kenkey and oil palm whilst some men engage in construction, carpentry and hunting. There are about 3 major (women) traders who buy maize, pepper, cassava, citrus and other farm produce in bulk for resale at external markets. Some villagers have migrated to urban centres and other areas with agricultural potential. The masons and carpenters migrate temporarily, to other villages, towns and cities for construction jobs especially in the periods when farm activity is low (June – August and October – January).

Transport implications of access to fuelwood and water: Fuelwood is usually obtained from farms and the open bush. The sale of fuelwood was not common until recently when a large scale dealer came to live here: a few people started supplying her. A few men burn and sell charcoal. The main sources of water are a borehole and the river: these are between 100 metres and 1.5 km distant (depending on the location of the house). Fuelwood and water collection represents a smaller transport burden than that experienced in Abora.

Access to credit, education, health and other essential services: Cash credit is very scarce in Sampa by comparison with Lome. No particular traders or residents offer credit to others for farm production. Some people get small amounts of credit from friends but this is for consumption and emergency needs on a short term basis only. We saw children here purchasing food snacks for breakfast and paying in kind (with corn). The nearest bank is at Dewurampong but few villagers have accounts there.

A nursery, primary and junior secondary schools are located within the village: a few villagers send their children to a private school at a nearby village which they feel provides much better schooling (Porter and Blaufuss 2003). Villagers travel about 6 km by road to Gomoa Adaa, the nearest health center, to receive medical attention.

Road conditions: The 7 km road to the main Cape Coast road and the nearest busy market (Kyiren Nkwanta) is unpaved. Some portions of the road are graded from time to time but the deteriorates rapidly owing to the poor grading and the high annual rainfall here. The road passes through the village and onwards to Akropong. Some sections of this road are very poor and during the rains in particular are thus avoided by local transport drivers. The people of Sampa usually weed along these roads prior to their annual festivals in Janauary and August. The men do the weeding and fill potholes and gullies with stones collected by the women.

Market access and patterns of trade: Taxis provide the majority of commercial services from the village to the main Accra – Cape Coast road junction and the main Kyeren-Nkwanta market. In general the frequency of vehicles to the village is low and irregular but more vehicles come in on market days than non-market days. The infrequent

transport services sometimes force people to walk to the Bro junction, a distance of 2.8 km, to board a car, or they may walk all 7 kms to Kyiren-Nkwanta market. A few traders visit Mankessim market, which is one of the largest in Central Region, to sell produce such as maize, citrus and palm nuts and buy items such as fish, bread, sugar and cloth to resell at the village. Trotros visit the village occasionally on market days to convey people to Manskessim market. Transport charges are usually high by comparison with those of nearby communities with better access. Thus it often does not make sense to travel to the market unless produce for sale is plentiful. Instead villagers often sell to the few traders resident in Sampa who bulk produce for sale elsewhere.

Transport charges: Taxis charge 1500 cedis per person and 1500 – 2000 cedis for a mini bag of maize over a distance of about 7 km to the market. Trotros charge 3000 cedis per person over a distance of about 40 km but are usually unavailable for local journeys.

2.2.4 Gomoa-Adabra

Adabra is located 7.2 km to the north of the Accra – Cape Coast road. It is made up of the main village and four satellite villages. The distance between the main village and the satellite villages ranges from about 250 to 1200 metres. Most of the inhabitants in the main village are Fantis whilst each of the satellite villages is inhabited mainly by migrant Ewes. The entire village has a total population of about 500 people. There are hardly any perceived activities among the people along clan lines. Instead, activities and relationships along ethnic lines are the commonest. The people are mostly Christians with a few animists. The houses are mainly built of mud and roofed with thatch. Buildings are relatively modest in size and construction, which might be taken as indication of poverty, but among the Ewes this is not the case. They are migrants from the Volta Region who visit their home towns regularly and usually aim to return to settle in their home area at some point in the future. They thus prefer to invest in good houses in their home towns.

Land allocation and tenure in Adabra: Farming is the main income generating activity. Land is owned and controlled by the chief of the village and people from one of the nearest villages. Access to land is mostly by cash rental or sharecropping. As much as 56% of lands surveyed are under cash rental, 33.3% under sharecropping and only 11% is family land. Access to land is difficult and expensive, hence the recourse to sharecropping and to making smaller farms. A large portion of land close to the village has been leased to two commercial farmers who produce pineapple and pawpaw for export. Some villagers say they do not know where all the land owners live and so cannot approach some of them to try to acquire land.

Farm labour in Adabra: The main sources of farm labour are family, hired and Nnoboa. The Nnoboa refers to a group of people who have come together to work together on their farms. The system is usually practiced by male groups. The nnoboa groups also take paid weeding contracts from other people. Many men belong to such groups because it makes the work more interesting and speedier. Some spouses make a joint farm. Here too the common Gomoa gender division of labour (in which men undertake land clearing and reweeding and women harvest, headload and do some reweeding) is evident. Most people use family labour except when the task is enormous or requires special skills.

Cropping patterns: Major crops grown are maize, cassava, pepper and groundnuts. Both single stand cropping and inter-cropping take place. Because land is scarce here, people do not assign specific locations to particular crops. The rainfall in the area supports major and minor season farms but minor season farms are usually smaller because the minor season rains are sometimes disappointing. There is no difference in the cropping patterns of men and women.

Farm size and location in Adabra: No respondent had more than 4 poles of land under cultivation at the time of the baseline survey. 37% of individual farms were below 0.5 poles in size. In addition, only 10% of respondents have more than 2 separate farms. All these features are indications of the relative scarcity of land in the village. The relatively small farm sizes result in smaller produce volumes and therefore a relatively limited transport burden.

Most farms are fairly close to the village (76% of all farms surveyed were within 2 km radius). There is one major path and an adjoining branch which is used by most people to travel to their farms. About 46% of farms are accessible by this route. The main path links to the largest farm area (called Akwakyire). All people who use this farm area usually come together to weed the path to make it wider. The path was once used by a tractor to a commercial farm and the villagers hope it can be widened for IMTs. Narrow paths are the main barriers to the use of transport modes other than head porterage. However, the mapping of respondents farms show that about 20% of all plots under cultivation are accessible in whole or in part by roads: IMTs and other vehicles could be used to access these.

Farm related transport tasks in Adabra: The fact that farms are relatively small, distances to farm short, and many farms accessed by the same route, indicates that the transport burden between farm and village is relatively limited, by comparison with the other Gomoa villages.

Inputs which need transporting to farms include planting materials (their own stock, gifts from relatives and friends, or purchased from others at Adabra or at Kasoa market.)

The transport burden is highest at the major season harvest. Maize is mainly stored at the village because farms are relatively close to the village and fairly small, so people are able to convey all their produce to the village within the harvest period. The major mode of transport for carting produce from farm to the village is head porterage. The baseline survey showed that all respondents use head porterage for carrying farm produce though, in a very few cases, a push truck from a neighbouring village has been used occasionally. Produce is usually carried by the women and children of the household. People sometimes also obtain assistance from their neighbours for carrying produce during the major harvest seasons. This is particularly true for the harvesting of cassava for gari processing (a fairly common activity among Ewes in Adabra). Hiring of porters is not common.

Transport implications of off-farm activities: Trading is the second most important economic activity after farming and is carried out mainly by women. Much cassava processing is also undertaken by women at the village. This processed produce, together with unprocessed maize, is taken by women to the regional market at Kasoa market (about 22 km away) every week. Many women visit the market regularly to sell their

own produce, produce they have purchased for resale, or their husband's produce. This makes for a high transport demand on market days. Some women also hawk gari and cowpea around nearby villages on foot. Men sometimes engage in group hunting expeditions on foot.

Transport implications of access to fuelwood and water supplies: People obtain fuelwood from their farms and the open bush over relatively small distances (i.e. no further than the most distant farm). With the exception of two people who occasionally sell fuelwood in small quantities, no one sells fuelwood or charcoal at the village. The main sources of water at the village are a bore hole and a pond. These are located within the village or at the immediate outskirts (usually within a distance of 50 – 500 metres for the main village and up to a maximum of 1.5 km for the satellite villages in the dry season.) Transport of water is therefore more of a problem for people in the satellite villages than those in main village. Both water and fuelwood are conveyed by women and children using head porterage.

Access to credit, education, health and other essential services: Cash credit is mainly available through four susu schemes operating across the main village and its satellites. Adabra is the only study village where susu seems to thrive, promoted and run by Ewe migrants. Almost everybody in the village belongs to one such group. The groups loan money to the members and non-members for both farming and non-farming activities. However, interest is higher for non-members (about 120% p.a.) than members (about 80%). Patronage in these susu is very high, especially among the Ewes.

A nursery, primary and junior secondary schools are located within the main village and these serve the satellite communities (and two near other nearby villages). There is no market place so people usually sell items such as fish, meat, farm produce, drinks and processed food at their homes or hawk them round the village. There are 3 grinding mills, one in the main village and two at the satellite villages. Both grinding and grating apparatus are available at each of the milling points. People have to travel a distance of about 9 km to obtain medical care from the nearest clinic (at Kwanyako).

Road conditions: The road from Adabra to the main road was untarred and in fairly poor condition at the time of the baseline surface. The village is about 22 km from Kasoa market. The 7.2 km road joining the major paved road (Accra – Capa Coast road) deteriorates rapidly during the wet season. Grading is carried out from time to time but does not last long. One satellite village is about 300 metres from the main village and situated by the Adabra – Akoti Junction road. The remaining three satellite villages are about 1 – 1. 2 km from the main village and are served by a very narrow track of about 500 metres which terminates at the second satellite village. Vehicles cannot reach the last two satellites so people from there have to take their loads to the first satellite village to board vehicles.

Market access and pattern of trade: Taxis run through the village on their way from Kwanyarko to the Akoti Junction and the main Accra-Cape Coast paved road. Direct trips to market, however, are usually made by trotro or mummy wagon. These larger vehicles visit the village only on market days. By the time these vehicles reach Adabra they may be full, since they will have already picked up people and produce from about 5 other villages. The number of vehicles that visit the village ranges from 1–5 per day, depending on the time of the year, usually more vehicles in the main harvest season.

Owing to vehicle non-availability on some market days, some people use taxis to the main junction and then board trotros from there to Kasoa market. The people at the satellite villages often have to headload their produce to the main Adabra - Akoti Junction road to obtain a vehicle.

Transport charges: Taxis charge 1500 cedis from Akoti Junction to Adabra village and 1000 cedis in a reverse direction over the same distance of 7.2 km. This is because the junction is their main terminal and they charge a flat rate of 1500 to Kwanyarko, the final destination. The market trotro charges 1800 cedis per person and 3000 per mini bag of maize or gari over a longer distance of 22 km. Owing to the few vehicles plying this road they are usually overloaded, especially on market days. At the time of the baseline survey two people (one at the main village and another at a satellite village) owned a taxi but neither taxi was based at the village (they had been sent to relatives at the paved road). A few people owned bicycles but most were broken. The bicycles are used for leisure and errands and visits between villages and the junction.

2.3 Comparison between the 4 Gomoa study villages

2.3.1 Demography and village organisation

The tables below help to illustrate variations between the study villages. Lome is the largest and wealthiest village with the highest population, whilst Abora is the smallest and the poorest with the least population. The wealth of the villages is generally manifested in the type of building. However, Adabra is an exception. At Adabra many of the inhabitants are Ewe migrants from Volta Region who prefer to invest their money back home. All the communities are dominated by Christians, except Lome where there is a significant number of Muslims. In Lome, clans are well organized and have firmer control over land ownership than in any of the other villages. Some activities in Lome such as festivals, games, and payment of funeral dues, are therefore organized along clan lines and squabbles are mostly settled by the elders of the clans. At Adabra such events and activities take place along ethnic lines (Fantis and Ewes). At Abora and Sampa, more organization occurs at the communal level, especially in Abora.

Trading activity is higher at Adabra than in any of the other villages. This is due in part to its closeness to the Kasoa market, a major regional market on the Accra – Cape Coast road.

Comparison of the demographic and organizational characteristics of the Gomoa study villages

Criteria	Lome	Abora	Sampa	Adabra
Population	About 2000	260	About 1100	4 – 500
Age structure of population	Balanced	High adult/elderly ratio	Balanced	High youth and middle age ratio
Ethnicity	Mainly Fantis	Mainly Fantis	Mainly Fantis	Fantis and Ewes
Religion	Christianity and Islam	Mainly Christianity	Mostly Christianity. A few Muslims	Mostly Christianity and a few Traditionalist
House types	Mud, brick & block with iron sheets	Dilapidated mud and brick house with iron sheets	Mud, brick & block with iron sheets	Mainly mud, unplastered with thatch roofings
Temporary settlements	Present	Not present	Not present	Not present
Satellite settlements	Not present	Not present	Not present	Present
Migration	A little temporary out-migration	High out-migration	A little temporary out-migration	High in-migration by Ewes
Wealth status	Richest of all survey villages	Poorest of all survey villages	Average among survey villages	Average among survey villages
Credit availability at village	Available through wealthy individual	Very scarce	Scarce, but available from a few individuals	Mainly available through (Ewe-dominated) susu groups
Other economic activities	Some female traders & male artisans	Mainly sale of fuelwood; hunting by men	Some women traders, a few male artisans	Trading by most women.
Organization of events & activities	Mostly along clan lines	Mostly at community level	Mostly at community level	Mostly along ethnic lines
Social structure	Decisions taken by chiefs, village elders and clan heads	Decisions taken by chief and elders mainly.	Decisions taken by chief and elders mainly.	Decisions taken by chief and elders mainly.

2.3.2Comparison of farming activities in the Gomoa study villages

The intensity of agricultural production varies between the communities. Lome has the highest agricultural potential and the scale of agricultural activity there is higher than in any of the other villages. Abora ranks lowest in terms of agricultural production. The nature of soil, the relatively low rainfall and the relatively high level of poverty are three of the major causes of low agricultural productivity in Abora. It is easier to obtain land at Abora than any of the other villages and most difficult at Adabra. The land ownership arrangements at Abora allow all people free access to land but other factors such as labour shortage, the high average age of the population and extreme poverty do not allow them to make bigger farms. People at Adabra, though relatively wealthier than those at Abora, do not have enough land and the little they can get is relatively expensive. Consequently, people at Abora and Adabra have relatively small plots under cultivation. The mixture of freehold, cash rental and sharecropping systems operating at Lome and Sampa enable people to get access to substantial areas of farm land and this, together with their relative wealth and labour availability, enables them to make comparatively large farms.

Long-term tree crops are common in Lome and Sampa, and there is a little cashew at Abora. Very few long-term cash crops are grown at Adabra. Tree crops yield over a substantial time period and provide a continuous flow of income to the owners. They are often perceived as a form of security against old age. The absence of long maturing cash crops at Adabra is partly due to the fact that many of the inhabitants are migrants

and may return eventually to their home towns. Also the land is very expensive and most people cannot afford large portions of land for tree crop production.

Lome produces the highest quantity of food crops whilst Abora produces the lowest. Both major and minor season crop production takes place at all villages except Abora where there is little or no minor season cropping, due to its position in the south of the Gomoa District, close to the coast where rainfall is very low.

Differentiating farm features in the Gomoa study villages

Criteria	Lome	Abora	Sampa	Adabra
Land availability	Available	Readily available. Has largest land per head	Available	Available but expensive.
Land ownership	Clan	Communal, individual	Clan, extended families and stool	Individual, external landlord.
Land tenure	Mostly cash and free use and few sharecropping	Mainly free	Hired by cash, sharecropping and free use	Mostly cash rental and sharecropping
Land use form	Bush fallow at individual and clan level	Bush fallow by individual farmers	Bush fallow by families and individuals	Bush fallow by individual landlords
Labour availability	Seasonal bottlenecks	Scarce	Seasonal bottlenecks	Seasonal bottlenecks
Main type of farm labour	Mainly hired and family	Mainly family, some hired	Mostly family, some hired	Hired, family or 'Nnoboa'
Sizes of separate farm	Small to large	Mostly small	Small to medium	Mostly small
Average no. of farms per person	3	2	3	2
Relative volume of farm transport loads	Largest of all 4 villages	Smallest of all 4 villages	Second largest of the 4 villages	Only larger than Abora
Planting material sources	Within village, NGO and external market	Mainly from within village	Within village and NGO	Within village and external market
Growing of tree crops	Much cashew and oil palm; some citrus	A few cashew and cassia	Much oil palm, citrus & sugar cane	Very few long maturing cash crops
Crop type by distance from village	Maize at distant farms, cash crops closer to village, other crops anywhere	No clear pattern	Cash crops closer to village, food crops anywhere	No clear pattern
Cropping system	Both intercropping and monoculture	Mostly intercropping	Mostly intercropping	Mostly intercropping
Cropping regime	Both major and minor cropping	Mainly major season cropping	Both major and minor season cropping	Both major and minor season cropping
Rainfall	High by Gomoa standards	Very low by Gomoa standards	High by Gomoa standards	Average by Gomoa standards
Food production levels	High by Gomoa standards	Very low by Gomoa standards	Average by Gomoa standards	Average by Gomoa standards
Point of storage of maize	Both at village and farm	Mainly at village	Mainly at village	Mainly at village
Point of sale of maize	Mainly at village	Mostly at nearest market; some at village	Mostly at village; a little at nearest market	Mostly at nearest market; some at village
Food processing	Some	None	Some	Plenty

2.3.3.Comparison of transport and accessibility issues in the Gomoa study villages

The magnitude of transport problems differs between the survey villages. Abora is the closest to a paved road but it faces a severe transport problem because of the lack of regular motorized transport services to the village. At the time of the baseline survey it was easier to get a vehicle for external travel at Lome than at any of the other villages. A few vehicles operate commercially to Adabra and Sampa but none visits Abora unless it is hired. This makes the vehicle charge per km to Abora the most expensive. The figures in the table below show that the taxi charge to Abora is about 6 - 8 times as expensive as that of the other villages. There is not much difference between the transport charges at Lome, Sampa and Adabra. Everywhere, the longer the distance traveled, the lower the per km charge, in part because a larger proportion of all long distance trips are along paved roads (see R7149 Final Technical Report).

Taxi charges are higher than trotro charges in all the villages (and commonly across coastal Ghana). Trotros have a higher passenger and load capacity and lower running cost per passenger.

Villagers tend to visit market using conventional motorized transport when they can afford it, except in Abora where the shortest journey to market is by footpath. Adabra is located farthest from a major market and Abora and Lome are the closest. Only Lome and Sampa have small retail markets in allocated spaces within the village.

Farms at Lome extend further from the village centre than elsewhere. All Abora and Adabra farms are at a relatively short distance from the village centre. Hiring of porters is common in Lome for transporting farm produce and construction materials whereas in Sampa head porterage is used most of all for construction purpose. Nearly three-quarters of the porters in the study villages are in Lome and are hired mainly for carrying maize. Lome is in a major maize producing area and the distance to the main maize plots is very long. This creates a major transport burden. Hiring of porters is not common at Abora and Adabra. Physical barriers are common on farm routes within Lome and Sampa village areas but are virtually absent at Abora and Adabra. The operations of IMTs between farm and village are thus likely to be more difficult in Lome and Sampa than Abora and Adabra.

Comparison of transport and access features in the Gomoa study villages

Criteria	Lome	Abora	Sampa	Adabra
Distance to nearest paved road (km)	4.5	3.3	7	7.2
Distance to main market center (km)	5.5	4.8	7	22
Presence/absence of village market	Present	Absent	Present	Absent
Vehicles based at night at the villages (may operate elsewhere in daytime)	3 trotro 1 taxi	1 taxi	None	None
Conventional transport availability	Good on market days, otherwise poor	Very poor	Poor	Good on market days (but may be full before reach Adabra)
Hiring of porters	Common (for maize & construction materials)	Not common	For construction purposes; occasionally for farm produce	Not common
Means of transport to market if funds available	Trotro and taxi	Head porterage	Taxi	Trotro or mammy wagon
Transport charge	Expensive	Very expensive	Expensive	Expensive
Taxi charge per km in cedis to nearest paved road	178	1364	214	208
Trotro charge per km in cedis to nearest major center	156 (to Nduem = 4.5 km) 82 (to Swedru = 23 km)	Not available	75	82
Road maintenance	By organized communal labour of men &women	By organized communal labour of men &women	By organized communal labour of men &women	Done by contractors hired by the district
Topography	Relatively flat with isolated hills	Relatively flat	Some hills	Relatively flat
Physical barriers on routes to farms	Unbridged streams, narrow paths, muddy spots	Narrow paths	Some hills, unbridged river, narrow paths, muddy spots	Narrow paths
Longest distance to farm (km)	8	3	8	4.2
Distance to main water source in dry season	0.1 – 5 km	3.3 km	0.2 – 1.5 km	0.1 – 1 km

The baseline data thus illustrates that there is a substantial transport burden in the study villages, though the size of that burden differs significantly between villages. People rely heavily on head porterage mainly by women and children for meeting their farm to village transport needs and not uncommonly also for farm to market transport.

2.4 Assin district

Assin district, Central Region's largest district, is located in the rain forest zone in an area of rolling topography (not dissimilar topographically to Gomoa), mostly under 400 feet. It has a higher rainfall than Gomoa though the pattern remains bi-modal, with the main rains in April-July and the minor rains in September-November (the minor farming season). As in Gomoa, settlements are generally nucleated.

Assin has a much stronger emphasis on cash crops than Gomoa, particularly cocoa. The cocoa farms of men are generally much larger than those belonging to women, though some women have a substantial interest in cocoa. Other cash crops include palm oil and citrus fruits. According to the District Plan, food crops grown in the district include maize, rice, cowpea, groundnuts, cassava, yam, cocoyam and plantain. Forest products including timber and a wide variety of non-timber products are grown for sale (Assin District Assembly 1996). As in Gomoa, women are the principal foodstuffs traders in Assin. Cocoa is sold by men and women farmers directly to the buying stations. At yields of around 900 kg per ha for cocoa, it is estimated it will take 15 person-days to headload one acre from farm to village using men, women, children and hired labour (Riverson and Capapetis 1991:6, citing Dapaah 1989).

Only one off-road village in Assin was studied in detail, Aworabo (25 km from the paved road) in the north east of the district. We had originally intended to confine our study to Gomoa districts but were requested to include a village in this district by MOFA regional office, Cape Coast.

2.4. 1. Assin-Aworabo

Aworabo is located 15 miles from the paved road on an earth road which is only accessible with a four-wheel drive vehicle in the wet season. Its local market, Akropong Odumase, is five miles away, and ten miles from the paved road. Access to other markets in Eastern Region, to the north, notably Oda, is easier than to Akropong and Fosu, but villagers at Aworabo say they prefer to trade in the markets of their own district.

The village, which has a Twi-speaking population of c.700, is (like all the Gomoa off-road centres studied) principally a farming settlement. It concentrates on cocoa, with rice, maize, cassava, oil palm and plantain as secondary crops. Cocoa is grown on loamy soils, oil palm on sandy soils and rice in the riverine swamp areas. The land is generally considered fertile so very little fertiliser is used.

There is ample land for farming here - everyone farms - and consequently settlers have also come in from other areas, including Gomoa. Land is owned by the stool, rather than individual families, and the Chief is custodian. Women are allocated land by their husbands. Stranger farmers used to pay for land directly, or through share-cropping, but the sharecropping arrangement has temporarily ended due to a legal dispute. Labour is also available, though the Chief, a major cocoa farmer, has imported labourers from northern Ghana. Group work parties, nnoboa, are found as in Gomoa. Many of the farms are very large and the average holding is substantially higher than in Gomoa, at 10-15 poles.

Agricultural production appears to be relatively high by Gomoa standards, but marketing, apart from cocoa is clearly a major problem. There are cocoa buying stations for COCOBOD (formerly the government's sole buying agency) and CASHPRO in Aworabo. COCOBOD used to supply inputs to the farmers, notably pesticides and production information. Other cash crops - such as surplus maize and cassava - are sold by village women or directly to traders who come to the village. Crop processing within Aworabo is limited: there is some processing of gari, palm oil and palm kernel and maize.

2.5 Differences among Gomoa and Assin settlements

The off-road villages selected for study vary considerably in terms of wealth and access. The villages in Gomoa are only around 3-8 km from the paved road, whereas the village in Assin is much further (25 km) away. Regarding assets, as we have seen some villages appear to be substantially wealthier than others, in terms of physical infrastructure (as measured by house construction materials etc.). Estimating wealth is extremely complex, but a survey of vehicle, radio and battery-operated television ownership (consumer goods much valued in the villages) in R7149 provided a broad indication of the diversity and emphasised the relative wealth of Aworabo in Assin district, compared to most of the Gomoa study villages, despite its distance from the road. This can be attributed to factors such as the more reliable, higher rainfall and high fertility of that region which allows a stronger focus on cash crop production, particularly cocoa. In R7575 more detailed wealth studies were undertaken: these are discussed in section 4.3.1 below.

Ownership of selected consumer goods in off-road settlements in R7149 (1998).

Consumer goods	**Abora**	**Sampa**	**Adabra**	**Lome**	**Aworabo**
Radios	4	?	10	?	Over 30
Working radios	0	?	10	?	about 10
TVs	0	?	2	8	4
Working TVs	0	?	2	7	3

In other respects the villages are very similar, notably in terms of their lack of basic facilities and services (apart from basic education), as the following table illustrates.

Facilities/services in the off-road settlements in R7149 (1998)

Facilities/ services	**Abora**	**Sampa**	**Adabra**	**Lome**	**Aworabo**
Schools (and no. of teachers)	1 primary (3)	1 primary (4) 1 JSS (3)	1 primary (6) 1 JSS (3)	1 Nursery (3) 1 primary (6) 1 JSS (5)	1 primary (4) 1 JSS (3) 1 private primary (3)
Electricity	no	no	no	No	no
Water supply	poor ponds, pipe at new site	borehole (20 c per bucket) and river	borehole (20 c per bucket) and pond	two standpipes and stream	borehole (20 c per bucket) and stream
Health: **traditional birth attendant** **health post** **clinic**	 0 0 0	 2 0 0	 1 0 0	 6 0 0	 ? 0 0
Post office	0	0	0	0	0
Credit sources	relations (scarce, save in case of sickness)	relations	relations and susu	bank, resident traders	Akoti rural bank, relations

2.6 Transport availability in Gomoa and Assin off-road settlements

Conventional motorised transport services

Although motorised transport was regular and frequent along the major paved roads of the two districts, off-road transport services were extremely poor. This is an area where population density is relatively low (though not by comparison with many parts of northern Ghana). [Unfortunately, data from the March 2000 census to illustrate this point is not yet available. The previous census was conducted in 1984.] Densities tended to be higher near the paved roads. We have here the low density conditions so common across sub-Saharan Africa, which results in lack of a critical mass of transport demand and presents such a formidable challenge to conventional transport planning approaches (IFRTD rural transport services e-mail discussion group, Oct/Nov 2000).

IMT usage

IMT use was very low across the two districts, and seemed to be mostly concentrated in wealthier settlements on the paved road, where IMTs included bicycles, motorbikes and push trucks. In the five off-road villages, IMT ownership and use was found to be extremely low in R7149 (completed 1999). IMTs had generally been obtained within the last few years, and were almost wholly owned and operated by men. They mostly consisted of bicycles, purchased by men for cash out of farming or hunting profits (these are areas where small game is still common and hunting widespread). Few women were found to have ever ridden a bicycle and, if so, these were generally young women who had mostly done so within the village centre, 'for pleasure'. Men did not generally loan out their bicycles to their wives. Push trucks were principally found in the district capital, Apam, and hardly encountered in rural areas (though two of the study villages had one or two trucks). The limited availability of transport means in the 5 villages is illustrated in the following table which shows ownership figures for both motorised transport and IMTs in 1998.

Village based transport in Ghana's Central Region: motorised and non-motorised ownership in the five study villages, 1998

Village-based transport	**Abora**		**Sampa**		**Adabra**		**Lome**		**Assin-Aworabo**	
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Private car	0	0	0	0	0	0	0	0	0	0
Taxi	0	1	0	0	0	0	0	0	0	0
Tro-tro	0	0	0	0	0	0	0	0	0	0
Bicycle	2	1	2	0	6	0	5	0	6	0
Motorbike	0	0	0	0	0	0	0	0	0	0
Push truck	0	0	0	0	1	0	2	0	0	0

The village baseline studies conducted in 2000 show that although motorized transport and cycle ownership had improved slightly by 2000, the overall access situation was little better.

3. PROJECT PURPOSE

The specific research objectives of the project were as follows:
"to develop transport strategies for improving farm to market access in off-road areas, focussing on IMTs. It will select and test a range of IMTs, mostly with women, assessing the technical, socio-economic and environmental implications of IMT adoption. Strategies will be developed to assist IMT assessment and adoption elsewhere."

The programme output that is being addressed by this work is: 'Strategies developed and promoted which improve food security of poor households through increased availability and improved quality of cereal and root crop foods and better access to markets'.

This report focuses on the socio-economic component of the research.

4. RESEARCH ACTIVITIES

This section provides detailed descriptions of the research activities conducted to investigate socio-economic and institutional issues.

4. 1 Timing of research activities, project personnel inputs and collaborator inputs, transport arrangements

The project commenced in February 2000. Mr Frank Owusu Acheampong, the Ghana field coordinator and Dr Gina Porter, the PI, began work at this time and continued on the project through to its completion in June 2003. In August 2000 a British-based research assistant, Ms Kathrin Blaufuss, was appointed for just two years: she spent in total 11 months in the field in Ghana and the remaining time working on the project in UK. Her time was split roughly into periods of around 2 months at a time in (Ghana) field and (UK) office locations. Frank Owusu Acheampong coordinated field work in Ghana and focussed on transport- agriculture and transport- marketing linkages. Kathrin Blaufuss focussed on gender issues and environmental impacts. Both Kathrin Blaufuss and Frank Owusu Acheampong were based for the majority of the research programme in Ghana in a small roadside village (Dewurampong), in Gomoa district. Gina Porter planned and coordinated the research programme, supervised (and participated in) field research activities and took a principal role in data analysis (with the exception of environmental data) and preparation of material for dissemination.

Occasional inputs to the socio-economic component from UK were provided by Dr Roderic Dutton (CORD, University of Durham) who made a visit to Ghana to advise on the establishment of IMT credit arrangements with the banks at the beginning of the project and a second visit at the time of the first workshop and by Ms Sylvia Quansah (Department of Economics, University of Ghana, Legon) who came to Durham University through a World Bank-funded internship programme to work on credit issues under the supervision of Gina Porter. Ms Quansah, staff from The Village Bicycle Project, and members of the linked Crop Post-Harvest projects in Kenya and Uganda (which had only recently started work), also contributed to our final regional workshop in Apam.

Our formal collaborators in Ghana were the Ministry of Agriculture Rural Infrastructure Coordinating Unit (RICU)'s Village Infrastructure Project and the MOFA Agricultural Engineering Service Department. Both Mr Boamah at AESD and Mr Oppong at RICU VIP and their staff provided advice and support throughout the project. At MOFA AESD, Mr Vincent Akoto organised lorry transport for our equipment to all the village workshops and provided substantial regular support in terms of IMT technical advice and training through the project to villagers on maintenance and safety through the project. RICU VIP provided a venue for our Consultative Group meetings in Accra and much ongoing information regarding progress of the VIP. Their regional office in Cape Coast provided local support, including an engineering survey of tracks and trails in the vicinity of our study villages (Mr Anang-Siaw). Upgrading of some of these trails, to complement our IMT introductions, was subsequently supported under the VIP programme.

All project researchers (with the exception of our MOFA and VIP collaborators) used local transport for accessing survey settlements; Frank Owusu Acheampong and Kathrin Blaufuss also both had second-hand bicycles which they used to visit the off-road villages closest to their base at Dewurampong. Using local transport (as opposed to a project vehicle) was important not just for reasons of economy or to indicate to villagers that we were not rich development tourists: it gave us a better insight into the difficulties of rural access and it put some small funds into the local economy.

The project was originally scheduled for completion in January 2003. An extension was agreed to 30 June 2003 to allow for extended monitoring of credit repayment arrangements, which were handed over to an NGO, CRAN, in July 2002 (following the completion of our monitoring phase) and for the possible implementation of a second round of IMT purchases to control group members.

4.2 Establishment of the Project Consultative Group

The Project Consultative Group was established at the commencement of the project, since it was perceived to form a crucial sounding board and principal source of advice for ongoing project design and general project conduct as well as an important channel for the dissemination of on-going project findings. The Consultative Group constituted for R7575 included the same organisations which advised on R7149.

Core members of the Consultative Group in R7575 included the following:

1. Our MOFA collaborators in the Rural Infrastructure Coordinating Unit's Village Infrastructure Project (Accra head office: Mr Oppong, the Director; Mr Sarpong; Mr. Mensa Bonsu; Mrs Adeline Offori-Bah; Cape Coast Regional Coordination Unit, Mr Larbi, Mr Anang Siaw) and in the Agricultural Engineering Services Department (Mr Boamah, the Director; Mr Vincent Akoto).
2. The District Chief Executives of Gomoa and Assin districts (and accompanying district staff). (N.B. DCEs changed following the December 2000 elections.)
3. Feeder Roads Department (Mr Ashong, subsequently Mr Danso).
4. Members of Self Help Foundation, one of the Ghanaian NGOs which has most experience with IMTs (and which was involved in implementation of the MOFA VIP pilot project.) (Mr Forster Boateng and others.

Occasional coopted members included Dr Dadzie (NR International, West Africa), University of Ghana, Legon (Ms Quansah) and IT Transport- Scott Wilson joint venture

staff providing DFID support to rural feeder roads at the Feeder Roads Department (Ms Oriel Kenny), and staff from the banks providing village services for our project (ADB, Assin Foso; Akyempim Rural Bank, Dewurampong.)

MOFA RICU, Accra, provided the venue for our meetings, held approximately every six months.

4.3 Baseline surveys (February 2000- January 2001)

Baseline surveys commenced in February 2000 and extended through to January 2001 when the first project IMTs were introduced. Where feasible, baseline surveys included the whole of the village, not just potential project IMT recipients. Sample survey form/checklist templates are provided in Appendix 2.

4.3.1 Wealth categorisation/perceptions

Discussion at the first Consultative Group meeting (Interim Report no. 1, April 2000) of R7575 and recommendations from Dr Ian Wilson (University of Reading Statistical Services Centre) regarding IMT beneficiary selection, led to the early institution of work on wealth categorisation prior to the wealth ranking exercises and selection of beneficiaries. We held discussions with a diverse range of people in each village about local terms for individual wealth categories, and how general categories of poverty and wealth are perceived. This led to discussions about the overall wealth structure of the villages, the wealth structure of nearby settlements (for comparison), about temporal changes in wealth, and about age and gender patterns of wealth in the village. We undertook the work with separate groups: the village chief and elders, groups of village men, groups of village women, and with key informants, notably school teachers. Twenty-four check list interviews on wealth categorisation in total were conducted in the villages, roughly five per village.

4.3.2 Farm survey: farm mapping, agricultural production and marketing

As a preliminary to work on the farm survey in 2000, it was necessary to obtain listings of village inhabitants (sex, age, occupation). In Abora a list (compiled for the Ministry of Health) was available, but elsewhere it was necessary to enlist local assistance (village heads, elders and teachers) to obtain a full list of inhabitants. Key informants (Chief and elders, committee members and teachers) then helped prepare maps of land holdings and farm boundaries in each village. The locations were subsequently checked with individual farmers.

A major baseline farm survey using a semi-structured questionnaire commenced in September 2000 (i.e. prior to the introduction of the project IMTs). This incorporated a wide range of questions regarding land ownership and tenancy, farm size, crops grown, labour arrangements and migrant farming. Off-farm occupations were also recorded where these occurred. Data all related to the previous year's farms.

Our aim was to ensure that there was baseline farm data on both the IMT beneficiary group and a non-beneficiary control group for each village. The control group was to be matched as closely as possible to the beneficiary group in terms of sex, size of land holding and available labour resources. Subsequent detailed comparison of beneficiary and control group farmers and their farms through the course of the project could then help us to draw conclusions regarding IMT impact.

In the smaller villages selection of a control group was easily accomplished since we could simply survey every inhabitant and then pick out an appropriate control group for analysis, once the IMT beneficiaries had been identified. In the larger villages, Lome and Aworabo, village size and the time-consuming nature of the baseline farm survey, forced us to delay the full baseline survey until the IMT beneficiaries had been agreed (November 2000) and to identify suitably matched control groups at that time, picked with the assistance of key informants.

4.3.3.Trial monthly diaries with current IMT (bicycle) owners

These diaries were kept between May and July 2000 by those few villagers who already owned IMTs: i.e. this was prior to the introduction of project IMTs. The owner or a literate villager, if the owner was illiterate, filled in record sheets according to usage of the IMT each day for a month. In some cases the exercise was repeated after a month's break. Information on purpose for which the equipment was used was completed on three separate sheets: one for the owner, one for when the IMT was loaned to family/friends, one for when the IMT was hired out.

This allowed us to learn more about current IMT use prior to the introductions, and to test the format for recording IMT diaries when the project IMTs had been introduced. Bicycles were the only IMTs currently in use in the villages at this stage (2 push trucks recorded at Lome in R7149 were out of use because the owner had travelled away from the village.)

VILLAGE	**No. of bicycle owners who kept diaries**
Abora	0 (no working cycles during the survey period)
Adabra	1
Lome	8
Sampa	1
Aworabo	6

4.3.4 IMT attitudes survey

Prior to the distribution of IMT equipment to beneficiaries, in January 2001, a survey on attitudes towards IMTs was undertaken. This aimed at the provision of quantitative data on the perceptions and uses of IMTs amongst community members, to complement the detailed qualitative studies being undertaken at the same time. The questionnaire included a ranking activity regarding the different IMTs, questions on the use of the various IMTs and whether respondents could *envisage* themselves making use of any of the transport items if they were available, as well as thoughts on anticipated changes due to the introduction of IMTs to the village.

The sampling strategy initially adopted was to follow transect lines through the settlement, but this had to be replaced by a more opportunistic strategy, given the limited period available for the initial survey, as well as general practicalities in the villages. Great care was taken, however, to ensure an equal representation of male and female informants. A sample size of at least 30 respondents per village was achieved.

4.3.5 Semi-structured interviews on attitudes to credit

Informal interviews were conducted in each village, mostly with women, regarding their attitudes to credit and the proposed credit system for IMT introductions. This extended preliminary work conducted in R7149.

4.3.6 Semi-structured interviews on membership of groups and attitudes to group formation

A preliminary exercise collecting information on group activities and attitudes to group formation had taken place in R7149. A brief review of conditions was conducted as part of the baseline survey.

4.3.7 Semi-structured interviews on village gender relations

Informal interviews were undertaken, mainly with women, regarding gender divisions of labour, family decision-making patterns and other issues potentially pertaining to gender relations. These were conducted, for instance, through specific discussions around women's recent travel, about decision-making on specific issues and also through broader life history interviews.

4.3.8 Load weighing

Head and bicycle loads were weighed on farm and market days along farm and market routes in each village, in July 2000, prior to the introduction of project IMTs. (This was repeated in June-July 2002). Weighing, conducted with assistance from the villages concerned, commenced as dawn broke and continued until 6 p.m. June/July was the most appropriate time of year for this exercise because it captured conditions in the early harvest period, but prior to the September peak when farmers would be too busy to stop and have their loads weighed.

4.3.9 Traffic count and review of conventional transport conditions

A traffic survey was conducted in January 2001 to provide comprehensive data on daily travel patterns on the major access routes of the study villages prior to the introduction of project IMTs. This survey was aimed at capturing variations in travel behaviour for different week-days (one market day and one non-market day per village). The data is gender disaggregated and indicates transport modes and direction of travel.

The count was generally restricted to the three major routes leading from each village: trafficable roads and major foot-paths (the latter mostly access routes to farmland). Traffic counts were conducted continuously from 6.00am until 5.00pm each day. This survey applied the same terms of reference as the traffic survey undertaken in R7149 in Novermber 1998 and used the same recording sheet.

In addition to the traffic count, information on vehicular charges for passengers and loads to their two major market centres and frequency of vehicles (with reasons for any major changes) was also collected. (This exercise was subsequently repeated at approximately quarterly intervals in each village).

4.3.10 Roads and paths: preliminary trafficability study

This review of major routes from each of the 5 study villages, from an engineering perspective, was undertaken by Mr Thomas Anang Siaw, an engineer employed in the Cape Coast regional office of our VIP collaborators. The surveys were undertaken

between May and August 2000 and considered trafficability in terms of both motorized vehicles and IMTs.

4.4 Identification and accessing of IMTs for testing

4.4.1 Review of IMT technical literature

A review of IMT technical literature commenced at the start of the project. This review, which included worldwide searches on published and grey literature, facilitated decisions regarding identification of appropriate types of IMT for introduction in the study area. A broad preliminary draft paper on IMTs was circulated in January 2001 and has been updated and recirculated at various stages in the project, following receipt of comments from IMT specialists in UK and Ghana. A final version was prepared in April 2003 (Porter 2003).

4.4.2 Discussions with stakeholders

Discussions regarding choice of IMTs for testing in the study area and related issues were conducted with a wide range of stakeholders in Ghana (villagers, district staff, local IMT repairers, MOFA VIP, MOFA AESD, SelfHelp Foundation and other NGOs such as ADRA, GRATIS, ITTUs, IMT suppliers, IMT manufacturers etc.), Kenya (KENDAT), UK (IT Transport, TRL, IFRTD) and the US (Village Bicycle Project).

4.4.3 Testing of hand cart prototype

Because of the great interest in the photographs of the 'Kencart' in R7149, expressed particularly by older women in the study villages, we decided that a similar piece of equipment should be made available to these villagers in R7575. Since neither the Kencart nor any similar piece of equipment was available in Ghana, we contacted ITTransport, which had made the original Kencart. The designer, Mr Ron Dennis, made available drawings which were subsequently used to commission a handcart from GRATIS, Tema. Once constructed this was taken to Abora village for testing under the aegis of a women's group (September 2000). There were a number of initial problems with punctures which had to be rectified. A report was prepared by Pascal Kaumbutho of KENDAT (2000) following his visit to Ghana for the preliminary village workshops.

4.4.4 Acquisition of equipment

Orders were made according to beneficiary selection (see 5.3.5). Push trucks were purchased from local manufacturers in Kumasi, cycles and wheelbarrows came from suppliers in Accra. An additional handcart was ordered from GRATIS. All were distributed to the villages by MOFA AESD in January/February 2001. Power tillers had to be shipped from China and did not arrive at the villages till May 2001.

4. 4.5 Agreeing mechanisms for making the intervention: Credit arrangements

Possible credit arrangements were reviewed by Dr Roderic Dutton during a visit to Ghana with Gina Porter in February 2002, during which he and other project staff met with villagers, district staff, our collaborators and other relevant ministries, equipment suppliers and repairers, NGOs and local banks which operate in the districts (Dutton, Interim Report no. 2). Following implementation of the credit arrangements with two local banks, various difficulties arose and required intervention. (These difficulties are charted in the interim reports.) Consequently, when the project was approached regarding a potential World Bank-sponsored internship for Ms Sylvia Quansah (M.Sc student, Dept of Economics, University of Ghana, Legon) at Durham University, to

review micro-finance in an IMT context, this was agreed. Thus a further review of credit issues by Ms Quansah took place in May 2002.

4.4.6 Selection of beneficiary individuals and groups: initial plans and the village workshops

Our initial plan was to select a range of beneficiaries from within the IMT applicant group in each village. We would either select a set of beneficiaries to reflect the range of age groups and socio-economic strata in each village, using a set of criteria established in discussion with the Project Consultative Group at our first meeting, or through a random draw, according to Consultative Group preferences. At the Consultative Group meeting in March 2000 members emphasised the importance of establishing wealth categories in the villages, rather than the selection of criteria by the Consultative Group. They also expressed concern about excessive subsidy and emphasised the need to maintain parity with (as yet undecided) VIP interest rates. Consequently, we undertook detailed wealth studies in the villages.

Subsequently, very substantial rises in the local cost of IMTs (even locally produced IMTs) due to cedi devaluation had a major impact on actual beneficiary selection, since despite the availability of credit through the project, the equipment cost was now far beyond the resources of the very poor women we had hoped to include. At the village workshops held in October/November 2000, six potential IMT types were displayed (men's bicycle, women's bicycle, push truck, hand cart, wheelbarrow, power tiller), on the basis of the technical review described in section 4. Applications from villagers for equipment were requested. We stated that, while women would be given preference, men could also apply for equipment (since we did not wish to antagonise men in the villages).

Individuals were encouraged to try out the equipment at the 5 village workshops, but were not required to make their application for an IMT until a few days later, when, in the presence of the research team and bank staff, they completed IMT purchase agreements and had their photographs taken for the bank documents. When the research team reviewed all the applications we found, even including men's applications, they were within the limit of our equipment budget and a decision was made to purchase all the equipment requested. Thus we did not have to select a sub-set of beneficiaries from a total applicant group.

4.4.7 Selection of control groups

We needed to select a small set of non-participant individuals as a control group in each village to compare with the IMT beneficiary group through the project. This raised potential questions regarding the likelihood of people being unwilling to allow detailed monitoring of their activities when they were excluded from the IMT scheme.

However, in practice, this issue did not arise. The control group members selected in each village all consented to being involved in the monitoring programme. They were assured that, if all the original IMT group repaid their loans, a second round of IMT distribution would be possible, and in this case individuals in the control group would have a first option to participate. Consequently, it was possible to work with control groups in which each individual was carefully matched (according to farm size, labour availability, age, sex etc.) to an IMT project recipient. The control group for Gomoa

district, like the beneficiary group, consisted of 46 respondents in total. The control group for Aworabo numbered 25, again matching the number in the beneficiary group.

Village name	Number of IMT beneficiaries	Number in control group
Gomoa-Abora	**10**	**10**
Gomoa-Adabra	**15**	**15**
Gomoa-Lome	**15**	**15**
Gomoa-Sampa	**6**	**6**
Assin-Aworabo	**25**	**25**

4.5 Monitoring programme

4.5.1 Developing a multi-method approach

We developed a diverse set of methods (principally, but not wholly, qualitative), for monitoring IMT use and its impact in the study villages, on the basis that a multi-method approach would provide beneficial triangulation of data. Where appropriate these replicated the baseline survey format.

4.5.2 IMT diaries

In order to monitor usage of the equipment supplied to beneficiaries, IMT diary check sheets (initially piloted with existing users, see baseline survey) were utilised. IMT activities (including separate sheets for own use, family use and hiring/lending) were recorded by designated recorders in each village. Attention was paid to the diversity of uses to which equipment was put.

The recorders made daily short visits to the IMT beneficiaries each evening, when farmers were most likely to be in their compound. Recorders were trained in the use of the check sheet and were paid a small monthly sum for their support with this data collection.

The IMT diary took place in alternating months, commencing March 2001. In order to allow for occasional absences of the IMT diary project staff from the village and at the same time ensure a continuous daily coverage, two people were appointed to jointly look after each group of beneficiaries. Lome had 4 recorders, because of the large number of beneficiaries in this village. Most of the village recorders were teachers.

4.5.3 Farm surveys (agricultural production and marketing)

Following the baseline farm surveys in each village, quarterly farm surveys were undertaken with the IMT beneficiary and control groups. Each survey covered the last 3 months of IMT use, farm activities, crops produced with point of sale/use, mode of transport, water and fuelwood collection details, farm inputs conveyed, all in considerable detail. A second broad 'overview survey' (to review overall change since the baseline survey) was conducted in March/April 2002. A decision was made to restrict data input into SPSS (and thus full quantitative data analysis) to the four Gomoa villages, because of the massive time input required for this component of the project.

4.5.4 PRA (seasonal calendars using preference ranking, time budgets, travel diaries)
A series of PRA exercises were undertaken at intervals through the monitoring period, including construction of seasonal calendars, time budgets etc. These were undertaken with groups of women and men in each village, but not restricted to the beneficiary IMT and control groups.

Seasonal transport calendars were focussed on establishing amounts of time spent headloading across the year (based on Pretty 1995, but modified to focus on time instead of farming cycles.) Twelve larger stones represented the months. Smaller stones were used to represent time spent headloading a selected commodity in each particular month. The group (of 2-5 men or women) selected the commodities they said formed an important part of their load carrying work using pairwise preference ranking. For each commodity they then gave three stones for a large amount of time spent, two for a moderate amount of time, one stone little time and zero insignificant or no time. The exercise was repeated with reference to transport availability. Participants were encouraged to discuss these issues during the ranking, and to talk about the impact or non-impact of IMTs. The seasonal calendar exercise was undertaken twice in each village, firstly in August 2001, then again in July 2002, (all following an initial piloting in Abora which led to refinement of the method).

An experimental, *time budget* observation exercise was also included in the PRA. Little work has been done to actually assess the problems of time budget methods in societies where time-keeping and rigid schedules are not a common part of daily life. People experience great difficulty in recollecting the precise time and even the approximate time spent on daily activities from the previous day, as is required in the recall method. An alternative experimental approach was thus attempted - direct observation and comparison with recall - in the first part of the monitoring period.

Direct observation obviously would be too time consuming for extensive data collection on time budgets, but we hoped that the comparison of observation and recall for different kinds of people would allow us to develop a formula which we could then apply to more easily collected (but commonly unsatisfactory) recall data. Kathrin Blaufuss followed one woman for a whole day, noting down duration time for each task undertaken. This was followed next day by interviewing the same person regarding her recall of her perceived time use on activities undertaken the previous day. Our experiment aimed to reveal whether the comparison of actual observation with next day recollection, for a series of different people (differentiated by age, sex, socio-economic status if these factors were shown to impact on recall) could be used to develop a rough calibration of perceived against actual time budgets. We found, however, that this experiment with a combined method (also subsequently attempted by Rachel Flanary in a linked study in Upper West) was still unsatisfactory, since the direct observation component proved too intrusive: the presence of the researcher appeared to substantially affect time spent on specific tasks.

As a replacement for the time budget observation exercise, *weekly travel diaries* using the recall method were collected through occasional interviews between January and July 2002, i.e. towards the end of the monitoring period. Various villagers (differentiated by age, sex, socio-economic status) were asked to recall all travel undertaken within the last 7 days. This included travel outside the community for reasons such as marketing, social visits, visits to health facilities etc. and all travel

within the vicinity of the settlement such as farming activities, firewood and water collection. Respondents found it difficult to recollect all trips made within the settlement and that component was discarded from the travel diary. Information was requested on transport fares (if applicable), the social context of the trip and whether any loads were carried. The time taken for each of the trips was also established as far as possible, even though time-estimation was difficult for most respondents.

4.5.5 Life histories as a source of gender relations and mobility data

Individual women and men in the communities were selected to participate in detailed discussions regarding their life, focussing on mobility patterns through the various stages in their life. Additionally, the life histories served as useful route to information on gender relations and changing relationships related to life course.

The interview usually commenced with a brief overview of the important stages in life as identified by the respondent. This ordering and related significant dates were then used as basic framework for more in-depth questions and discussions. The interview tended thus to follow a chronological order from childhood to adolescence, married life etc. However some topics were explored in more detail, whenever the informant was keen to elaborate on the issue. Between 2-6 women per community were initially selected to participate, however the repeated meetings proved difficult to coordinate, given the busy work schedule of some women. Thus some life histories could not be completed .

Initial life history discussions were limited to women, but the discussions were fruitful and thus subsequently extended to men, in order to develop an understanding of gender variations in mobility over the life course and how gender relations are perceived differently by women and men within the same communities.

Village name	**No. of life histories conducted with women (F) and men (M)**
Gomoa-Abora	4F, 1M
Gomoa-Adabra	3F, 1M
Gomoa-Lome	6F, 2M
Gomoa-Sampa	6F, 3M
Assin-Aworabo	5F, 1M

4.5.6 Other in-depth interviews on intra-household decision making and IMT impacts

Interviews on diverse topics with beneficiaries, control group members and other villagers extended through the project. The interviews were centred round (but by no means confined to) the use of IMTs and any perceived changes due to the introduction of the IMTs in the household and community. They include discussions on intra-household decision-making, allocation of financial resources to the IMT purchase in the household etc., use of conventional transport within the household etc. Special attention was drawn to IMT use during the harvesting season, the anticipated busiest season for the IMTs, and any changes in availability of time and time allocation resulting from the use of IMTs.

Broader topics included decision-making, resource allocation and gender relations in general terms. Efforts were made to obtain interviews in beneficiary households not just

with the spouse of the beneficiary, but also with children within the household. This provided further insights into gender relations

4.5.7 Interviews and focus group discussions with male and female porters

Many IMT owners and other community members indicated early in the project that they had plans to use IMTs during the harvesting period instead of employing porters, as they had done in the past. Hence, it was necessary to monitor the impact IMTs had on the livelihoods of porters through the project.

Detailed discussions were held with individual porters and small groups of porters from time to time regarding their perceptions and views regarding IMTs in the community. Special attention was drawn to potential loss of work and income. Male porters were also interviewed since respondents had mentioned that male porters would be likely to benefit from using the trucks in their work (this was generally thought not to be a suitable option for female porters).

4.5.8 IMT attitudes survey

The IMT attitudes survey undertaken as part of the baseline study was repeated when the monitoring and evaluation phase was well advanced, in January 2002. By this time the IMTs (with the exception of the power tiller which only arrived in May 2001) had been in use in the villages for almost one year. The aim was to generate data on any changes in attitudes and perceptions towards IMTs following direct exposure to their attributes and use in the villages. The same questionnaire design and sampling strategy (opportunistic sampling) were used as in the original survey. (It was not possible to find the original sample group in each village for reinterview.) As in the first attitudes survey, great care was taken to ensure an equal representation of male and female informants. A sample size of at least 30 respondents per village was accomplished, as in the original survey. Enlarging the sample size beyond this was not possible due to the short time period available for this survey.

The questionnaire included a ranking activity of the different IMTs, questions on the use of the various IMTs and whether respondents could envisage themselves making use of any of the transport items, as well as thoughts on changes observed since the introduction of IMTs in the village. An additional question, concerning the perception and use of motorcycles, was added in this second IMT attitudes survey. The question was raised at the very end of the questionnaire, in order not to skew the direct comparison of data from the two surveys.

4.5.9 Operation of groups (including project IMT groups)

Monitoring of group operations of all types in the survey villages was undertaken during the project. Particular attention was paid to the few groups established for project IMT purchase in Abora, Sampa and Aworabo villages.

4.5.10 Load weighing

Head and bicycle loads were weighed on market and non-market (farm) days along the busiest routes in each village in June-July 2002, as they had been in July 2000. Weighing again commenced as dawn broke and continued until 6 p.m. As in the baseline survey, weighing points were situated on approach routes to the village, but beyond the principal village water points

4.5.11 Traffic count and review of conventional transport conditions

The baseline traffic survey (conducted in January 2001) was repeated in all 5 study villages over the course of 10 days in September 2001 and again in early March 2002. The March 2002 survey captured conditions at a similar period of the year to January 2001 in terms of climatic and agricultural conditions. September 2001 data was collected to provide a picture of conditions in the main harvest period.

For each village one market day and one non-market day was selected, as in the baseline, to reflect variations in travel behaviour on different days. As in the baseline study, the three main routes from each study village were monitored continuously from 6.00am until 5.00pm each day.

Review of conventional traffic charges and traffic frequency

Information on vehicular charges for passengers and loads to their two major market centres and frequency of vehicles (with reasons for any major changes) was also collected, as in the baseline survey. Checks were made at approximately quarterly intervals in each village.

4.5.12 Interviews with children, their parents and teachers

To our surprise we discovered, soon after the project IMTs were introduced, that in many households children were being enlisted to operate the equipment and had become the main operators of project IMTs. This prompted a much stronger focus on obtaining *interviews with school children, children who do not attend school,* parents and teachers, regarding the use of IMTs, than we had anticipated (though interviews with children had been included in the baseline survey). Interviews were held with individual children, parents and teachers on children's use of IMTs, on children's general travel patterns, loads they are expected to carry at certain ages and their school-travel. Issues of road safety training and accidents were discussed. The importance of road safety awareness for operators of IMTs on main roads was raised. Issues like changes in children's work-load were examined carefully over the project period.

An effort was made to keep the interviews with children as informal as possible: they were easily intimidated and in the initial interviews only the bravest in a group would speak.

As a complement to conventional interviews we set up discussion meetings and a school *drawing competition* in the village Junior Secondary Schools (except Abora which does not have a JSS.) These schools are attended by boys and girls in the age-range c.13-20 years. The group discussions were conducted separately with boys and girls and concluded with a drawing competition on the topic "My village and the use of bicycles, trucks and wheelbarrows". The winners were given prizes of school-bags, story books and colouring pencils and all participants received exercise books.

Another school exercise included a *vote on IMTs with polling cards*. Children of all three classes in Junior Secondary Schools (JSS) in each of the study villages were joined together for this exercise, and again they were split into a girls' group and a boys' group. Discussion focused on the children's use and experience of certain IMTs (bicycle, wheelbarrow and push-truck). A polling card with questions and optional answers to tick had been prepared and was administered to the children in form of a secret vote. The content of the vote related to changes in work-load, time spent on

headloading and IMT use as well as changes in income due to headloading porter work or work with IMTs. Further discussions after the vote were held in order to gain more qualitative feed-back and to encourage active discussion amongst the children.

The series of interviews on children's travel patterns, use of IMTs and accident/road safety issues, (including accidents through IMT use), was subsequently extended to include other schools serving the study districts: Senior Secondary Schools in Dawurampong and Apam, Dewurampong JSS, Eshiem Assin Foso JSS, and a private school at Gomoa-Mankessim which runs a bus service to outlying villages (including Sampa.)

4.5.13 Bicycle repair workshop

Lack of IMT maintenance emerged as a major issue in the study villages as the project evolved. Consequently, in conjunction with an NGO, the Village Bicycle Project, we held bicycle repair workshops in four of the study villages (Sampa was excluded because it had too few bicycles and none had been purchased through the project). Men and women from the communities and any local bicycle repairers were invited to join the day-long workshop where basic skills such as puncture and bearing repair were demonstrated.

4.6 Field studies of other IMT projects

During the course of the project small field studies of other IMT projects in Ghana were undertaken. These included the VIP pilot IMT projects in Greater Accra and Ashanti districts, the Ministry of Health motorcycle programme, and a brief review of IMT projects in northern Ghana. (Frank Owusu Acheampong also participated in the preliminary workshop and field visits of the linked Kenya CPHP project which took place in Kenya in 2002.)

4.7 Linkages with related (DFID CPHP -funded) and other IMT projects

Linkages were maintained with the two DFID Crop Post Harvest IMT projects in Uganda and Kenya, though unfortunately both were delayed and started much later than the Ghana project. Pascal Kaumbutho (KENDAT, Kenya) visited Ghana to advise on technical aspects of R7575 in October/November 2000 and thus was able to attend most of our first five village workshops where IMTs were selected by villagers for purchase. Representatives from both the projects in Kenya and Uganda attended one of the five final village workshops and our final regional workshop in Apam in July 2002 (as did Cheikh Bamba Thioye who runs the International Forum for Rural Transport and Development West and Central Africa Regional office, Dakar.) Frank Owusu Acheampong visited Kenya for the Kendat workshop in 2002.

A linked ESRC CASE project on gender and transport issues in Upper West Region, Ghana, including IMTs, is supervised by Gina Porter. Linkages were also developed with a small rural access project which included work on IMTs (R7924) funded by DFID CPHP in northern Nigeria. The Nigeria workshop in Jos was attended by four people involved in R7575: Vincent Akoto, Frank Owusu Acheampong, Kathrin Blaufuss and Gina Porter (project leader on both projects).

5. OUTPUTS

This section summarises the research results and products achieved by the project. Where possible these are presented in quantitative form, using tables, graphs etc. However, qualitative studies formed the principal approach in R7575: much of this data cannot be presented in tabular form. Broad results of the qualitative research are thus presented in condensed narrative form: greater detail is available in the published papers and interim reports which have been produced in conjunction with the project. These are listed in Appendix 3.

5.1 Establishment of the Project Consultative Group

The Consultative Group met at 6 monthly intervals through the project and provided crucial advice on project design details and an important route for the dissemination of interim findings. Consultative Group members also attended the preliminary village workshops and the final regional workshop at Apam.

Members of the Group expressed interest in forming a broader national transport association: this led to the establishment of a Ghana National Forum Group for Rural Transport, linked to the International Forum for Rural Transport and Development, (following the attendance of Ms Priyanthi Fernando [executive secretary of IFRTD] at the Consultative Group meeting in August 2000.) Ghana has subsequently been represented at international meetings of IFRTD by members of the National Forum Group (i.e. Consultative Group members).

5.2 Baseline surveys

Note: here and elsewhere in this paper, names have sometimes been changed to maintain confidentiality

5.2.1 Wealth categorisation/perceptions

Our discussions indicated some diversity in terminology and perceptions both within and between villages. However, a common set of broad terms were identified which proved useful in subsequent discussions around village livelihoods. In most villages men's groups argued that there was no clearly gendered wealth/poverty pattern, though in Adabra the men's and women's groups both suggested men were better off than most women. In Lome women linked women's lack of 'strength' to smaller farm size and thus women's greater poverty. At Aworabo it was reported that men are better off in the cocoa season because they own cocoa farms, but in the off-season, when women earn money from petty trade, they seem better off. The headmaster at Abora suggested that most women are poorer than men there because men can make bigger farms and hunt grasscutter which can provide a substantial supplementary income.

No firm relationship between wealth and number of wives or children was reported in any village. Wealth patterns were considered directly related to farm size in Adabra and Assin Aworabo, but less so in Abora (where rainfall is low and it was noted that some people gained wealth principally from trading) or the other villages. In Lome it was suggested by one women's group that women are poorer because they can't make such large farms as men. In all villages it was noted that individual personality may affect displayed characteristics, e.g. miserly rich men who do not provide donations at ceremonies; middle people who spend a lot on dress so they might be thought to be rich.

Wealth category in English	Fanti/Twi term	Usage of term in study villages
Very rich	Osikani mmapa/ Odefo/ Osikafo	Has money, mansions, vehicles and other valuables. Donates large amounts of money at festivals. May put up buildings for the community. May give out large loans.
Rich	Osikani	Lacks nothing, has everything you need in life, has plenty of money and an expensive property, a car, quality clothes. Possibly tiles or asbestos sheets on roof of house. Can employ labour on a permanent basis. Own land and may rent or give out land to others for sharecropping to increase income. May own tree crops as owns land. Take key roles in ceremonies (so long as has dignity/respect/good relations with rest of community). May give out loans. Pay school fees easily. Some work to become osikani, others inherit their wealth.
Moderately rich	Osikani	As above. May be able to buy a car/taxi. To buy a cycle you would need to be Osikani (Chief, Abora).
Neither rich nor poor	Owoaham/ Atotobribidi/ Odzeyeni/ Mmudenmoni/ Anto-osikani/ Adantem	Has the basic necessities but struggles: can build a house, but does not have goods in abundance like the rich i.e. cannot make more wealth easily. Even in the lean season can afford to buy clothes, utensils etc. May have a zinc/iron roof on house. Has chairs in house and owns travelling bags (Aworabo elders). Can afford to reserve some grain through to next harvest season. Eat meals with fish/meat. Can afford to hire labour to make larger farms. Can go to clinic/hospital whenever need to do so. May send children to secondary school. Doesn't borrow much and repays promptly. Tend to take loans only for commercial ventures and may give out small loans. Rents land and does not need to do sharecropping. Category includes most teachers (and cocoa purchasing clerks in Assin Aworabo). To own a cycle (or a corn mill) you need to be mmudenmoni (Adabra, men's group and Chief; Lome, mixed group; Sampa, mixed group and elders; Aworabo, elders). May even be able to afford a car/taxi or a battery TV.
Poor (permanent)	Ohiani	Lacks many things in life (possibly due to bad luck, bad start in life, sickness). May not have own house and can not afford maintenance. Houses roofed with bamboo/thatch. No chairs in the house. In emergencies has to borrow (clothing for gatherings, also cash). Can not afford clothes and may not be able to afford enough food in the lean season. Will probably have sold almost all grain by January. May get only a single meal each day: may eat hardly any meat/fish. Can't afford to hire labour: may join nnoboa. Only go to clinic/hospital when the situation is critical (will probably have to borrow for this). Rarely can loan to others, delay repayment of loans they obtain. Have to enter share-cropping arrangements. Do the labouring work at ceremonies (eg. arranging chairs). Very unlikely to own a bicycle. Things never improve.

Poor (temporary hardship)	Ahokyere	Unlike Ohiani this is not a permanent state, but due to particular circumstances such as a bad harvest: they are strong, able and willing to work, things may improve.
Very poor	Ohiani/ Ohiani nemi-nemi	
Destitute/ wretched	Kwaliweaban/ Ohiani buruburoo/ Ohiani dobodobo/Ohiani fitafita	Can't work on a large scale and has very little to live on. May sleep with an empty stomach. No home. May not have a wife. Only one set of clothes, clothes may be torn. May not even have money to buy soap to wash clothes. Probably no kerosene for a lamp at night. 'Lives at the mercy of others'. Not consulted when decisions made. Problems may be caused by witchcraft (Sampa, mixed group).
Lazy	Kweadiurofor/ Kwadwofo/ Kwahweabon	Does not work at all though has the strength to do so - not willing to work - and so has nothing. Squanders what s/he is given. Obtains clothes from others. Roams round the town. 'People associate him with all scandals' (Adabra, men's group). Term is an insult.

5.2.2. ***Farm survey: farm mapping, agricultural production and marketing***

The farm survey data is discussed in section XXX where detailed comparisons are drawn between conditions in the baseline study and that of 2002.

5.2.3 Trial monthly diaries with current IMT (bicycle) owners

In total, 30 cycles were recorded as present in the 5 villages, of which only two were owned by women. The majority were in Lome and Aworabo (10 each): there were only 3 each in Adabra and Abora and one in Sampa. However some of these were broken throughout the baseline study period.

The trial monthly diaries came from 16 cycle owners, all except one of whom were male: the exception (a middle-aged trader in Lome who in R7149 had been keen to persuade women to try cycles and who had hired a cycle herself for pleasure), had recently purchased her cycle and occasionally used it to travel up to and down from the nearest market at the paved road, but it was mostly used by her sons to do errands (transporting trade goods, collecting produce from the farm) for her. It was used very occasionally for fuelwood and water collection.

Of the men, two were teachers, the remainder were farmers who commonly combined this work with another occupation (hunting, trading, carpentry, blacksmith, tailor). It is this combination of occupations which tends to enable villagers to find the funds for a cycle (as in R7149) and at the same time necessitates use of a cycle to make more efficient use of their time. Most cycle owners were in their 20s; the oldest was 48. The data suggests that cycles are used by their owners for a diverse range of activities: particularly social visits (inside and outside the village), for going to church, for traveling to and from the farm, collecting produce from the farm and to take inputs (pepper seedlings, maize seed, cassave tubers) to the farm, for occasional hunting trips, to bathe at the river (at Sampa), and in a few cases very occasionally for carrying water or fuelwood. The majority of usage of cycles for visits to farms to work, take inputs and collect produce (cassava, maize, plantain, vegetables) was recorded in Assin-Aworabo. Elsewhere, the cycles are perceived more as equipment for personal travel.

Most do not generally use their cycles for carrying produce or other loads, though they may occasionally tie a sack to the cross-bar, or, more commonly, cycle with a small load on their head. Maximum loads carried on a cycle were estimated to weigh around 15 kgs.

The cycle owners loaned out their cycles to men only: mostly to family members, occasionally to friends, most of whom borrowed the cycle principally for social visits or for traveling to school, though occasionally also for visits to the clinic, for a hunting trip, or for farming-related activities.

Hiring is less common. One farmer hunter at Adabra regularly hired out his cycle to young men from the village and nearby hamlets to get to the paved road (at 1,500 cedis return, the same price as the taxi.) A Lome farmer also hired out his cycle to young men who took it to school or to get to the junction. The remainder did not loan out their cycles at all.

Two of the 16 cycles were out of use for part of the recording period. With the exception of Lome (the largest village), where someone has recently set up as a part-time cycle repairer, there are no facilities for repair in the villages. At Aworabo the nearest cycle repairer and parts supplier is located about 35 kms away at Oda.

To summarise:

- Most IMTs in the study villages prior to the project were bicycles.
- All but one of the bicycles were owned by women.
- Cycle owners tended to be those with non-farm incomes who can afford them.
- Cycles are used for a wide variety of activities but with the exception of Assin Aworabo are mostly used for personal travel.
- Cycles are used only occasionally for load carrying (except in Assin Aworabo).
- Cycles are loaned to family members but only hired out infrequently.
- Repair facilities are inadequate.

5.2.4 IMT attitudes survey

The attitudes survey was an important element of the baseline research and is thus discussed in some detail. The baseline attitudes survey in January 2001 reflects attitudes to IMTs just prior to their introduction, but after the initial village workshops. The majority of the analysis which follows focuses on gender differences, though crosstabulations by village are also indicated where these are important to the discussion around potential and anticipated change.

Villagers were asked to rank the following IMTs according to which they would personally find most useful (i.e. without taking into account affordability): wheelbarrow, handcart, push-truck, power tiller, men's bicycle, women's bicycle, donkey cart. They were also asked to include the conventional motor car in their ranking, in order to see how this compared. The following table shows first preferences:

IMT/vehicle type	No. of times this IMT stated as first/joint first preference (N=181, M=97, F=84)*
Wheelbarrow	3 (3M, 0F)
Handcart	16 (4M, 12F)
Push –truck	37 (23M, 14F)
Power tiller	41 (17M, 24F)
Men's cycle	19 (16M, 3F)
Women's cycle	16 (13M, 3F)
Donkey cart	0 (0M, 0F)
Car	49 (21M, 28F)

*There were only 159 respondents in the baseline survey (78 men and 81 women), but 19 men and three women gave tied first choices.

This table shows that the dominant first preference is the conventional motorcar. However, the power tiller comes a close second. This is not surprising, given the versatility of this piece of equipment: including the fact that it can be used for a range of tasks in addition to transport (see IMT review report, Porter 2003). The locally made push truck is also highly ranked, perhaps in part because it is so familiar to villagers: they have seen the truck in action in local markets across the region (again, see review in the IMT report.) Other IMTs are much less popular, especially the donkey cart and wheelbarrow. Both men's and women's cycles are ranked above these IMTs, but well below the push truck and power tiller. In terms of gender preferences, apart from the handcart, only ranking of cycles is clearly strongly skewed by sex, though women also show less interest than men in the push truck: all of the latter three pieces of equipment are seen as more useful to men than to women.

Despite the strong interest in IMTs evident in the attitudes survey, only 25% of men respondents in the survey and 18% of women respondents had made an IMT application. The reasons given for not doing so were varied. Over a quarter of both men and women surveyed were absent from the village at the time the applications were required, while shortage of money was given as a major reason by over one-quarter of women interviewed and nearly one-fifth of men. No one suggested that lack of interest was the main reason.

Main reason for not making an IMT application to the project

	Not present in village	Sickness	No money	No interest	Already owned by self/ family	Not eligible	Not able to operate by self	No work for IMT	No children to operate	Other/ mixed reasons
Male (N=59)	27.1%	5.1	18.6	0	5.1	1.7	1.7	0	0	20.3
Female (N=67)	25.4%	3.0	26.9	0	4.5	0	4.5	1.5	1.5	17.9

A breakdown of the data by village adds further detail:

	Not present in village	**Sick ness**	**No money**	**No interest**	**Already owned by self/ family**	**Not eligible**	**Not able to operate by self**	**No work for IMT**	**No children to operate**	**Other/ mixed reasons**
Gomoa-Lome (N= 39)	27.0%	2.7%	21.6%	0%	5.4%	0%	0%	0%	0%	27.0%
Gomoa-Abora (N=30)	22.7	0	13.6	0	0	0	4.5	4.5	4.5	31.8
Gomoa-Sampa (N=32)	26.7	6.7	26.7	0	3.3	0	0	0	0	10.0
Gomoa-Adabra (N=30)	23.8	4.8	23.8	0	9.5	6.3	14.3	0	0	4.8
Assin-Aworabo (N=30)	31.3	6.3	31.3	0	6.3	0	0	0	0	18.8

This suggests a similar pattern across all the villages, though interestingly, lack of money is evinced as a reason for lack of purchase slightly more often in the three villages (Aworabo, Lome and Sampa) which on many counts appear wealthier (in terms of dress, housing, possession of material goods etc.)!

Respondents were asked whether they had ever used various items of equipment, in order to gain some idea of how this impacted on attitude: the results are shown below.

Equipment type	**No. who have ever used (N= 161, M=79, F=82)**	**No. who have *never* used**
Motor transport	160 (78 M, 82F)	1 (1M, 0F)
Man's cycle	68 (55M, 13F)	93 (24M, 69F)
Women's cycle	10 (8M, 2F)	151 (71M, 80F)
Push truck	76 (48M, 28F)	84 (31M, 53F)
Power tiller	33 (18M, 15F)	128 (61M, 67F)
Wheelbarrow	63 (45M, 18F)	98 (34M, 64F)

This table illustrates the fact that both men and women are far more familiar with conventional motorized transport than with IMTs: only one individual in the survey said they had never traveled by motorized vehicle. Of the IMTs, they have used the push truck most commonly: this is rather surprising, since there were only pushtrucks based in one of the five survey villages at this time; however, over half of both the women and the men in the survey had been present at the IMT village workshop and thus would have had chance to try out equipment then. Also, if they have been moving goods in a market centre, they may have used them there. Women were far less likely to have used a cycle than any other piece of equipment: this is related to a range of factors, but notably the lack of opportunity to learn to cycle (see Porter and Blaufuss 2002, Porter 2003).

Respondents were asked the degree and nature of changes (positive and negative) they anticipated would occur in their village as a result of IMT adoption: the table below indicates that men were extremely positive about the potential for IMTs to change

conditions; women were less convinced, but 68% still thought they would bring a big change.

	Big change	Medium change	Small change	No change	No response	Don't know
Male	82.3%	11.4	3.8	1.3	1.3	0
Female	68.3	13.4	3.4	0	11.0	4.9

Every man interviewed in the survey and 92.7 % of women thought that this change would be positive (usually stated in terms of reduced load carrying), though 10% of men and 2.4 % of women also anticipated there might be some negative impacts.

We asked a further question regarding potential impact of IMT introductions on quantity of produce grown in the village. All except one man and one woman (who couldn't decide) thought they would lead to an increase in production.

	Will change quantity grow	Will not change quantity grown	No response	Don't know
Male	94.9%	3.8	1.3	0
Female	89.0	9.8	0	1.2

Virtually all men (97.5%) and all women (98.8%) thought that IMT introductions would make life easier for women in the village. Just one woman (1.2%) thought that IMTs could make life harder for women. 98.7% of men and 97.4 % of women also thought the IMTs would make life easier for men, though two women thought they could make life harder for men.

We also asked if the IMTs would change the way people helped one another carry produce from farm to village: 81% of men and 85.4% of women thought it would. However, only 59.5% of men and 58.5% of women thought the IMTs would alter the way they used conventional motorized transport and only 40.5% of men and 45.1% of women thought they would affect the overall pattern of conventional transport services to the village. Only 27.8% % of men and 32.9% % of women thought the IMTs would impact on the quality of local roads and footpaths. However, a definite increase in firewood collection was anticipated by every man and 96.2% of women.

Broad conclusions from the 2001 baseline attitudes survey are as follows:

- Shortage of money had restricted many respondents, especially women, from applying for project IMTs.
- The local push-truck is the IMT most familiar to respondents (despite the fact that hardly any push trucks were present in the villages at the time of the survey).
- Men and women are positive about the potential of IMTs to impact positively on a range of tasks. Men are particularly optimistic.

5.2.5 Semi-structured interviews on membership of groups and attitudes to group formation

A preliminary exercise collecting information on group activities and attitudes to group formation had taken place in R7149. A brief review of conditions was conducted as part of the baseline survey. This indicated that groups remain few in number and

restricted in scope, by comparison with the situation in other areas of Ghana (especially northern Ghana). Most are inactive.

Apart from two church groups in Lome which had made a joint farm, no joint group income generating enterprise appeared to be operating. The welfare groups are principally concerned with ensuring contributions for the bereaved at funerals and supporting sick members. The other groups, such as farmers groups (which principally exist as a means of soliciting external loans), are mostly dormant, existing in name only. The farmers group at Lome, for instance, is still highly indebted on a loan taken out about 1997. The strongest groups are the welfare group in Aworabo and the ADRA (Adventist Development Relief Agency) cashew groups (but the latter are very dependent on external ADRA support.) Church groups are focused on religious rather than secular activities.

Village groups reported 2000

Village name	**Village groups, 2000**
Gomoa-Abora	ADRA cashew growing group, church groups, export pepper growers association, maize growers association.
Gomoa-Adabra	2 susu groups, church groups, welfare group (with hamlets)
Gomoa-Lome	Church groups (including Moslem group), ADRA cashew growing group, farmers group (dormant).
Gomoa-Sampa	ADRA cashew growing group, church groups (including Moslem group), youth association (dormant)
Assin-Aworabo	Welfare group, church groups (including Moslem group), Farmers association, Cassava Brokers association.

From our findings it seemed evident that working through groups was far less likely to be successful than in some other parts of Ghana, particularly given the difficulties in an IMT context where group ownership implies shared responsibility for maintenance and repairs. These findings confirmed our earlier conclusions in R7149 but did not prevent us from accepting applications from groups for IMTs in the project. We wished to see how transport groups worked out in practice.

5.2.6 Semi-structured interviews and life histories: data on village gender relations

Interviews were conducted through the baseline study period prior to IMT introductions. Broad conclusions relevant to the project include the following:

- Women tend to defer to men in decision-making.
- One of the common reasons for argument is women's absence from home.
- Most women and men are likely to experience more than one marriage in a lifetime.
- The tasks women perform reflect their roles and help shape their identity as women: water carrying, firewood collection, cooking, house cleaning, carrying for a range of family and community purposes, selling produce and other items, specific agricultural tasks, principal child care responsibilities.
- Men's tasks similarly reflect their roles and help shape their identity as men: land clearance, a range of other farming tasks, hunting, local road mending, building houses etc. Men will be laughed at if they do certain tasks, notably carrying fuelwood.

5.2.7 Load weighing

Weighing took place in June-July 2000. It is important to note that this period is not the peak season for load carrying, which comes rather later, usually around the September harvest period. However, farmers would have been too busy to stop to have their loads weighed at that time.

Head- and cycle-loaded weights recorded on footpaths and minor roads leading from the settlements during the baseline survey ranged from O.5 kgs for a cutlass to 65 kg for fuelwood. The commonest headloads carried were cassava, maize, fuelwood, pestles (Abora only), vegetables and charcoal (n.b. water from within the settlement was excluded from this exercise by selecting recording points beyond the settlement's in-village water points). The heaviest loads were recorded at Gomoa Abora, where fuelwood and pestels are carried regularly to Apam market for sale. One woman was recorded carrying 63kgs of fuelwood with a baby on her back over a distance of 8.2 kms. In this area rainfall is low and farming difficult: fuelwood provides a major source of income in many families. Men may help their wives and mothers to carry fuelwood, but will leave the village before dawn in order to avoid observation (since wood carrying is considered inappropriate for men.) Consequently, they were largely unrecorded in the survey: they deliberately left before the recorders arrived at the settlement on the survey days.

The largest volume of head and cycle-loaded traffic on any one route was recorded at Lome (the most populous settlement).

Maximum loads carried on specific routes in each village (in kgs), surveys June-July 2000

Village name F=farm day, M-=market day	**Women**	**Men**	**Girls (under 18) Age if under 16 yrs indicated**	**Boys (under 18) Age if under 16 yrs indicated**
Gomoa-Abora:				
Apam path M	58 kg	21 kg	34 kg	36 kg
Apam path F	61	52	22	31
Ankamu road F	30.5	27	20.5	21.5
Brofoyedur F	36	23.5	15 (12 yrs)	21.5
Gomoa-Adabra				
Farm path F	33	45	9 (14 yrs)	15
Kumakope M	42	45	22	22
Akoti junct. M	40	32	22	20
Gomoa-Lome:				
well path F	48	43	22 (13 yrs)	39
Nduam road F	24	38	36	34 (15 yrs)
Oguan road F	43	45	25	25 (15 yrs)
Gomoa-Sampa:				
Brofo junc.F	32	23.5	24	23.5
Okye river path F	42	31	18 (13 yrs)	19 (14 yrs)
Akropongjunc. F	42.5	46.5	25	19.5
Brofo junction M	44.5	10.5	26	24.5
Assin-Aworabo:				
Japan bridge F	37	26	30	18 (15 yrs)
Odumasi path M	36	35	12 (14 yrs)	11

Number and percentage of head/cycle load trips on specific village routes, June-July 2000

Village name Village name F=farm day, M=market day	Women	Men	Girls (under 18 years)	Boys (under 18 years)
Gomoa-Abora:				
Apam path F	57=55%	22=21%	12=11.5%	13=12.5%
Ankamu road F	27=27%	21=21%	23=23%	28=28%
Brofoyedur F	22=37%	16=27%	11=18%	11=18%
Apam path M	104=76%	11=8%	11=8%	11=8%
Gomoa-Adabra:				
farm path F	49=55%	28=32%	10=11%	2=2%
Akoti junct. M	22=59%	9=24%	4=11%	2=5%
Gomoa-Lome:				
well path F	127=44%	65=23%	41=14%	54=19%
Nduam road F	95=40%	57=24%	30=13%	54=23%
Oguan road F	75=45%	51=29%	24=14%	20=11%
Gomoa-Sampa:				
Brofo junc. F	46=43%	38=35%	14=13%	10=9%
Okye river path F	39=45%	40=46%	4=4.5%	4=4.5%
Akropong junc M	110=53%	53=25%	22=10.5%	24=11.5%
Brofo junctionM	38=70%	10=18	4=7%	2=4%
Assin-Aworabo:				
Japan bridge F	51= 39%	43=33%	18=14%	20=15%
Farm path F	34=44%	29=38%	2=3%	12=15.5%
Odumasi path M (in complete)	29=41%	34=48%	7=9%	1=1.5%
Total	925=47%	527=27%	237=12%	268=14%

The table below indicates the sum total of cycle loads included in the table above: three in all, all ridden by men in their 20s and 30s. Again, although the survey was limited, it indicates the remarkably low usage of cycles for load carrying in the study area.

Cycle loads, load weighing surveys May –July 2000

Village name	No. of cycle loads counted
Gomoa-Abora	0
Gomoa-Adabra	1 (10 kgs of books and clothing over 7 miles)
Gomoa-Lome	0
Gomoa-Sampa	0
Assin-Aworabo	2 (12 kgs yam over 5 miles; 6 kgs cassava sticks over 2.5 miles)
Total	3

The load data, although restricted in validity by the limited nature of the survey, nonetheless suggests a number of important features of load carrying in the survey villages:

- Women over the age of 18 years undertook almost half of all load-carrying journeys.
- The load carrying journeys of children under the age of 18 were almost as numerous as load carrying journeys by men over 18 years.

- Remarkably low usage of cycles for load carrying in the study area (only a few men.)
- Men, women and children all carry remarkably heavy loads.

5.2.8 Traffic count (January 2001)) and review of conventional transport conditions

The first traffic counts in R7575 took place in January 2001 (prior to IMT distribution).

Abora traffic count (market day at Apam) 21/01/01

	Ped. Male	**Ped Female**	**Bicycle Male**	**Bicycle Female**	**Motor vehicle**
Road to Apam Junction	83	104	12	0	20
Footpath to Apam	39	43	0	0	0
Footpath to Brofoyedur	29	25	0	0	0

Abora traffic count (non-market day) 22/01/01

	Ped Male	**Ped. Female**	**Bicycle Male**	**Bicycle Female**	**Motor vehicle**
Road to Apam junction	93	87	6	1	12
Footpath to Apam	15	7	0	0	0
Footpath to Brofoyedur	21	30	0	0	0

Sampa traffic count (market day at Kyiren Nkwanta) 23/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle Female**	**Motor vehicle**
Road to Sampa junction	103	97	10	0	70
Road to Akropong	119	84	4	0	35
Footpath to farms	135	333	1	0	0

Sampa traffic count (non-market day) 18/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle female**	**Motor vehicle**
Road to Sampa junction	82	67	11	0	27
Road to Akropong	238	149	3	0	5
Footpath to farms	139	373	0	0	0

Adabra traffic count (market day Kasoa) 26/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle female**	**Motor vehicle**
Road to Akoti	82	74	17	0	97
Road to Duafo	109	78	17	0	93
Footpath to Kuma	50	69	7	1	0
Footpath to farms	96	99	0	0	0

Adabra traffic count (non-market day) 17/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle female**	**Motor vehicle**
Road to Akoti	81	89	28	0	113
Road to Duafo	145	126	18	1	108
Footpath to Kuma	115	147	16	0	18
Footpath to farms	94	101	2	0	0

Lome traffic count (market day at Dawurampong) 19/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle female**	**Motor vehicle**
Road to Dawurampong	40	18	2	0	67
Path to Oguaa	60	16	0	0	10
Footpath to farms	310	312	2	0	0

Lome traffic count (non-market day) 20/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle female**	**Motor vehicle**
Road to Dawurampong	107	69	3	0	61
Path to Oguaa	97	32	1	0	2
Footpath to farms	245	311	1	0	0

Aworabo traffic count (market day) 26/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle female**	**Motor vehicle**
Road to Odumase etc.	149	64	1	0	21
Path to Nkukuasa	134	101	2	0	0
Footpath to Ayitey and farms	133	285	0	0	0

Aworabo traffic count (non-market day) 17/01/01

	Ped. Male	**Ped. Female**	**Bicycle Male**	**Bicycle female**	**Motor vehicle**
Road to Odumase etc.	141	67	7	0	25
Path to Nkukuasa	90	52	7	0	0
Footpath to Ayitey and farms	281	275	0	0	0

The IMT baseline attitude survey also included data on most recent use of conventional transport by the survey sample across the five villages, as indicated in the table below.

Most recent use of conventional transport by sample survey group(N=161, M=79, F=82).

	Today	**Yesterday**	**Last week**	**Last month**	**3 months ago**	**Last year**	**Over 1 year ago**	**Never**	**Total**
% of men	2.5	24.1	51.9	15.2	3.8	1.3	0	1.3	100
% of women	1.2	11.0	41.5	35.4	7.3	1.2	2.4	0	100
% of total	1.9	17.4	46.6	25.5	5.6	1.2	1.2	0.6	100

This shows that just over half of women in the survey (53.7%) and three quarters of men (78.5%) had traveled using motorized transport at some point over the previous week.

Analysis of travel data by village shows little variation across the villages:

	Today	**Yesterday**	**Last week**	**Last month**	**3 months ago**	**Last year**	**Over 1 year ago**	**Never**	**Total (N=161)**
Gomoa-Lome (N= 39)	2.6%	35.9%	43.6%	12.8%	2.6%	0%	2.6%	0%	100%
Gomoa-Abora (N=30)	3.3	10.0	43.3	36.7	6.7	0	0	0	100
Gomoa-Sampa (N=32)	0	12.5	59.4	25.0	0	0	3.1	0	100
Gomoa-Adabra (N=30)	0	16.7	36.7	30.0	10.0	3.3	0	3.3	100
Assin-Aworabo (N=30)	3.3	6.7	50.0	26.7	10.0	3.3	0	0	100

This table indicates that 82.6% of the surveyed population in Lome, 56.6% in Abora, 71.9% in Sampa, 53.4% in Adabra and 60% in Assin Aworabo had traveled by motor vehicle in the week prior to the survey. The relatively low percentages for Abora and Adabra may be explained in terms of relative poverty compared to the other settlements, coupled with very poor access to transport. The particularly high figure for Lome reflected recent grading improvements on the road linking it to its nearest market on the paved road at Dewurampong.

General conclusions from the traffic count and surveys made prior to project IMT introductions:

- The majority of journeys in the study villages are made on foot.
- The incidence of motor traffic is far higher than the R7149 traffic surveyed, because of recent grading of local roads. This grading can be partially attributed to R7149, which drew the attention of the District Chief Executives and others to their appalling condition.
- Vehicles are often as common on non-market days as on market days (in contrast to 1998).
- Cycle traffic is remarkably low, with the exception of Adabra, and almost exclusively male operated. No other IMTs were recorded.
- Travel by motorized vehicle is commonplace: three quarters of men and half of all women surveyed had used motorized transport in the last week.

5.3 Identification and accessing of IMTs for testing

5.3.1 Review of IMT technical literature

The review, which included worldwide searches on published and grey literature, facilitated decisions regarding identification of appropriate types of IMT for introduction in the study area. This resulted in the circulation of two reports on IMTs in Ghana to transport and gender specialists in Ghana, UK and elsewhere (Porter 2001, 2003).

5.3.2 Discussions with stakeholders

Consultation with a wide range of stakeholders resulted in the selection of a fairly limited range of IMTs which were mostly available in Ghana.

5.3.3 Testing of hand cart prototype:

Once constructed this was taken to Abora village for testing under the aegis of a women's group (September 2000). There were a number of initial problems with punctures which had to be rectified. A report was prepared by Pascal Kaumbutho of KENDAT (2000) following his visit to Ghana for the preliminary village workshops.

5.3.4 Agreeing mechanisms for making the intervention: credit arrangements

Rather than giving out IMTs to villagers for this IMT impact study, we had decided to try to obtain repayments on credit over one or two years (2 years for the power tiller.) The sum repaid could then be used to fund a second round of IMTs, with first option going to those people who had agreed to being used as a control group for the detailed farm surveys. MOFA VIP asked us to use the interest rate they would probably apply in the VIP (22%), which we did.

Semi-structured interviews on attitudes to credit had been undertaken in R7149 and were continued in the early stages of the current project. One of the major difficulties was to find a method of arranging credit which would be satisfactory to the villagers. Many were highly suspicious of traditional 'susu' credit arrangements.

The following discussion between Kathrin Blaufuss and an elderly woman, Mary Anoaba, and her daugher in Lome (June 2002) well illustrates many of the difficulties associated with susu and similar saving arrangements in the villages:

> MA: those who collect the susu are not good to be trusted. If they collect the susu and then think it is enough for them to travel with then they are off.
>
> KB: has that happened before?
>
> MA: yes, several times here in Lome
>
> KB: have they ever come back?
>
> daughter: sometimes they return and pay the money they owe in instalments and other times they don't come back. I have made susu with a man before and that man did not run away, but the second man who came, he ran away with the money of other people. That's why I stopped doing susu. When the first man went away, I decided to make susu on my own and I made a box and put some money inside, but someone stole the box. I sell sugarcane so I went to Abodom to buy sugarcane to sell. So when I went I gave my key to a certain girl to sleep in my room. When I came she wasn't around and when I found her she said that the room was locked when she came and she knocked but none opened for her. When I came I decided to open my money-box and nothing was in the box. Since the girl did not stay in the room and I don't know who slept in the room and locked the door, I have no means to get money the money back.
>
> KB: how long ago did the susu collector run away?
>
> Daughter: about 4 months now
>
> [note: the first collector stopped the susu and left Lome whereas the second person ran away with the money]
>
> the first susu collector was a teacher and got transferred. Now only Kwenu is collecting susu. There was a second person, also a teacher, but his girl-friend stole all the susu money. And Kwenu also ran away with the money. I stopped doing susu after the first person left Lome.

KB: why had you decided not to continue since you had good experiences with the first susu collector?

Daughter: at that time I was not working

KB: how do you do about savings now?

Daughter: we have no money to save, the money we have, we use.

This suspicion of susu in the project area, our project decision to keep the research studies firmly separate from monetary transactions, and strong expressions of interest from two local banks, led to our decision to utilize these banks to supervise collections.

5.3.5 Selection of beneficiary individuals and groups: the village workshops

Individuals were encouraged to try out the equipment at the workshops (see Workshop Report, 2000), but were not required to make their application for an IMT until a few days later. The following purchases were then agreed:

IMT project purchases:

VILLAGE	POWER TILLER 20,500,000 cedis	HAND CART 350,000 cedis	PUSH TRUCK 350,000 cedis	WOMEN'S BICYCLE 400,000 cedis	MEN'S BICYCLE 400,000 cedis	WHEEL-BARROW 200,000 cedis
Gomoa-Adabra			**6F 6M**		**1F** ** **2M**	
Gomoa-Lome			**8F 5M**		**1F**	
Gomoa-Sampa			**2F 3M**			**1M 2 groups (comm'ty)**
Gomoa-Abora	**1 group* (1F, 2M)**		**1F 1M 1 group (8F, 1M)**			
Assin-Aworabo	**1 group (5M)**	**1F**	**4F 7M**		**3F 9M**	**1F 3M**

*** Initially two groups elected to buy a power tiller at Abora, but one withdrew.**
**** Initially after the workshop this woman asked for a women's cycle, but then said she actually wanted a man's cycle with a cross-bar.**

Sampa was the village which showed least interest in purchasing IMTs. Villagers subsequently said this was because of the topography here and the fact that their best farmland lay across a river and was only accessible by raft or a long journey by road: they thus did not perceive IMTs to be useful. (The main impediment may have been the river, since topography is almost equally rolling in parts of the other settlements where the IMTs were adopted and is far more rugged in parts of Volta Region where IMT uptake has been quite substantial.)

The popularity of the push trucks is clearly ascribable to their familiarity in the survey area. The selection of men's cycles by women seems less logical, but it soon emerged that most women had no intention of cycling themselves. As one woman at Assin-Aworabo subsequently stated, '*I have not regretted collecting it because I collected it for my husband'* (who lets her ride pillion on Sundays when they want to go to town.) (Faustina, June 2002).

Despite the general reluctance to form groups in the study districts we were interested to find some group applications for IMTs. These mostly came about because the people in question had insufficient funds to purchase the equipment they wanted on their own.

A few changes of ownership, from one woman or one man to another (of the same sex) took place. The following table shows that most IMT equipment transfers occurred within a few days of purchase. It provides some insight into the perceived value and uses of IMTs in the villages. Inability to pay for the equipment was a factor in 4 of the 10 transfers.

Changes in project IMT ownership:

From	**To**	**Equipment type**	**Date of transfer**	**Reasons for rejection**
Emmanuel Tetteh	Obed Akomaning Agyin	Bicycle	Day of collection	(They were taking other equipment in the family). 'I am a driver and I don't stay here often. If I collect a bicycle it would lie idle. So I handed it over to that boy, because he is here all the time. When you came with the IMTs to distribute, that boy was around and I told Frank that I don't want to collect it'
Joseph Akumi Kontoh	Samuel Djan	Bicycle	Day of collection	He did not have money. After the application Djan told Frank Owusu that he wanted a bicycle, but it was too late. Even before delivery Joseph told Djan that he would not collect so the transfer was logical.
John Dogbe	Nana J.K. Tano	Truck	6.March 2001	John was not in the village on numerous occasions and the chief Nana had expressed his interest.
Abena Ketuwah	Amma Fio	Truck	Day of collection	Abena was not in at day of delivery. She initially wrote her name down, but her female relative wanted to collect it. This relative was not there when we came for the application. The husband of the relative asked Abena to stand in for the wife. At day of delivery, the female relative was still not there and Abena was also not present. Amma, a friend of Abena, agreed to collect for Abena and pay for her. When the female relative came, she decided not to take up the push-truck, because they had already collected a bicycle and wheelbarrow and another piece of equipment it would

				be too much for them to pay. They decided to reject one and probably re-apply next year. Amma was also interested in the truck and when the others rejected it, she said she had already paid for it and is interested, so they should give it to her.
Isaac Daitey	Paul Asare	Bicycle	30.04.2001	Isaac is staying at a hamlet. The daily recorder could not go there on a daily basis, so another beneficiary was required. Isaac gave money to someone for the 1st payment. Asare came to Frank Owusu and told him he had said to Richard Boateng (IMT recorder) that he would like to take the bicycle now.
Ali Amukoano	Kwame Tani	Truck	Day of collection	According to Kwame, Ali can never pay for it. They are brothers and Kwame was also interested, so he decided to take it up, because he couldn't apply for in the first place as he had traveled at that time.
Ekua Akyamfoah	Mr. Osei	Truck	Day of collection	Mr Osei was interested and Ekua and her husband thought that collecting two trucks, together with the one their son was collecting, was too much. It would have been three in the household. According to Ekua, she made the payment of her own money before handing it over. According to her husband, on the day of collection, they did not want to come forward and they informed Mr Osei, who gave Ekua the money to pay.
George Simpson	Teacher Nyanko	Truck	18. May 2001	'Because of my driving work with my taxi, I want to hand-over the truck. I don't have anybody to operate it as for now. I am busy with my car. I made arrangements with someone that he will pay the outstanding months and even the 1st payment I made, because I haven't used it at all. Since I am not using the truck, I don't get any profit from it, whereas the other person can use it and get profit. Since my farm is at the road side, I can use my car to convey my harvest. My

				wife's farm cannot be reached with truck. The road is too narrow, it is only a path. The teacher has a farm, he does vegetables and water melon. He can use the truck.'
Esi Kuma	Esi Kygreba	Truck	24.02.2001	
Dzreke Abor	Hanah Aduafo		24.02.2001	'I do not need the equipment and would like to give it to somebody, because things are not good now and I would not be able to pay. But next time if things are better, I would like to apply'.

To conclude regarding project IMT uptake:

- Many women were unable to afford IMTs because of cedi devaluation.
- Overwhelming popularity of the pushtrucks because of their familiarity.
- Total lack of interest in women's cycles (seen to be less strong.)
- Women who obtained cycles intended to pass them over to men.
- Limited group purchase (only five groups, of which two were necessitated by the massive cost of the power tillers.)

5.3.6. Selection of control groups

Individuals selected for the control group in each village all consented to being monitored. They were assured that, if all the original IMT group repaid their loans, a second round of IMT distribution would be possible, and in this case individuals in the control group would have a first option to participate. Consequently, it was possible to work with control groups in which each individual was carefully matched as far as possible (according to farm size, secondary occupation, labour availability, age, sex etc.) to an IMT project recipient (46 in Gomoa, 25 in Assin). An example of the matched pairs, for Lome village, is shown below:

LOME

IMT OWNER	CONTROL COUNTERPART	BASIC CHARACTERISTICS AND COMMON FEATURES UNDERLYING THE PAIRINGS (IMT owner/control)
Akua Aframah	Akua Gyeiba	Sex: F/F, Age: 46/43, Ethnicity: fanti/fanti, Chd: 8/4, Chd at sch: 3/3, Both married, Other occupation: trading/trading, Food crop farm size: 8/2, Crops: m, c, pp, k/m, c, pp, Tree crop: 15 acre cocoa & 10 acre oil palm/none Livestock: 16 goats & 21 sheep/5 goats, Labour: h, s, f/h, s, f, Land ownership: father's/Hired, Land tenure: free/cash, Housing: own/family & hired, Bank account: none/none, Remittances: none/none
Adwoa Maning (Abiba)	Barikisu Idriss	Sex: F/F, Age: 36/34, Ethnicity: fanti/fanti, Chd: 6/4, Chd at sch: 6/4, Both married, Other occupation: trading/trading, Food crop farm size: 3/2, Crops: m, c, p/m, c, t, pp, Tree crop: none/none, Livestock: 3 goats/4 goats, Labour: h, s, f/h, s, f, Land ownership: husband/Hired, Land tenure: free/cash, Housing: husband/father, Bank account: none/none, Remittances: none/brother
Efua Terbah	Adwoa Mansah	Sex: F/F, Age: 37/31, Ethnicity: fanti/fanti, Chd: 5/3, Chd at sch: 5/2, Both married, Other occupation: trading/trading, Food crop farm size: 3.25/1.25, Crops: m, c, pp, g/m, c,

		Tree crop: none/none, Livestock: none/none, Labour: h, s, f/h, s, f, Landownership: Hired/family, Land tenure: cash/free, Housing: husband's/grandmother's, Bank account: none/none, Remittances: none/none,
Abena Donkor	Adwoa Sakyiwa	Sex: F/F, Age: 62/52, Ethnicity: fanti/fanti, Chd: 5/5, Chd at sch: 2/0, Marital status: married/widow, Other occupation: none/none, Food crop farm size: 4/6, Crops: m, c, o p ,g, pp, t/m, c, y, Tree crop: 4 acre cashew, 5.5 acre oil palm & 9cocoa/30 cocoa Livestock: 4 goats/none, Labour: h, s, f/h, s, Land ownership: family/Hired, Land tenure: free/cash, Housing: own/own, Bank: Akyempim/Swedru GCB, Remittances: sons/none
Sarah Kontoh	Esi Akyere	Sex: F/F, Age:30/, Ethnicity: fanti/fanti, Chd: 1/3, Chd at sch:1/2, Marital status: divorced/divorced, Other occupation: trading/trading, Food farm size:1/, Crops: m/m, c, k, pp, t, Tree crop: none/none, Livestock: none/none, Labour :h, s, f/h, s, Land ownership: Hired/Hired, Land tenure: cash/cash, Housing: grandfather's/grandmother's, Bank account: none/none, Remittances: brother/none
Amina-tu Ali	Adjala Esi Kotua	Sex: F/F, Age: 37/31, Ethnicity: fanti/fanti, Chd: 5/3, Chd at sch : 4/1, Both married, Other occupation: trading/trading, Food farm size: 6.75/1, Crops: c, m, g, t, /m, c, k, pp, t, Treecrop: none/none, Livestock: 6 goats/none, Labour: h, s, f /h, s, Land ownership: family & hired /Hired, Land tenure: free & cash /cash, Housing: family/grandfather's Bank account: none/none, Remittances: none/none
Mariama Mbroma	Abena Yaba	Sex: F/F, Age:31/34, Ethnicity: fanti/fanti, Chd:7/5, Chd at sch:7/4, Both married, Other occupation: trading/trading, Food farm size:1/3, Crops: m, c, p, pp, g, t/m, c, pp, g, t, Tree crop: cashew/none, Livestock: 3 goats/none, Labour: h, s, f/h, s, f, Land ownership: family/hired, Tenure: free/cash, Housing: husband/mother-in-law, Bank: none/none, Remittances: none/none
Paul Simpson	Charles Turkson	Sex: M/M, Age: 49/54, Ethnicity: fanti/fanti, Chd: 4/5 Chd at sch: 3/3, Both married, Other occupation: masonry/painting, Food crop farm size: 4/7, Crops: m, c/m, p, Tree crop: 3 acre cashew/4 acre cashew & 2 oil palm Livestock: 21 goats/7 goats, Labour: h, s/h, s, f, Landownership: family/Hired, Land renure: free + sc/cash Housing: own/hired, Bank account: Akyempim/SwedruGCB Remittances: none/none
Kwame Abubu	Kofi Atta	Sex: M/M, Age: 50/32, Ethnicity: fanti/fanti, Chd: 10/4, Chd at sch: 1/2, Both married, Other occupation: hunting/hunting & carpentry, Food crop farm size: 12/10, Crops: m/m, Tree crop: 3 acre cocoa/3 acre cocoa, Livestock: 12 goat/none, labour: h, s, f/s, Land ownership: Hired/Hired & caretaker, Land tenure: cash/cash & sc, Housing: father/own, Bank account: none/none, Remittances: brother/none

Nana Yaw Acquah Ababio II	Opanin Kofi Gyasi	Sex: M/M, Ages:68/63, Ethnicity: fanti/fanti, Status: chief/village elders, Chd:12/6, Chd at sch:2/2, Both married, Other occupation: none/carpentry, Food farm sizes:17/15, crops: m, c, pp, p/m, c, p, Tree crop:6 acre cocoa/2 acre cashew & 1 acre Oil palm, Livestock:22 sheep, 4 goats/ 30Sheep&8Goat, Labour: h, s, f/h, s, f, Land ownership: Hired /own, Land tenure: cash/free, Housing: community palace/uncle, Bank account: Swedru ADB/none, Remittances: none/none
Isaac Nyarko	Samuel Gyekye Asante	Sex:M/M, Age: 29/27, Ethnicity: fanti/Akim, Chd: 1/3, Chd at sch: 1/3, Both married, Other occupation: teaching/teaching, Food farm size: 12/7, Crops: m, c/m, c, t, pp, l, tt, bb, Tree crop: 3 acre cocoa/none Labour: h, s, f/ h, s, Livestock: none/none, Land ownership: Hired/Hired, Land tenure: cash/cash, Housing: family/hired, Bank account: Akyempim/Akyempim, Remittances: none/none
Alex Yaw Sam	Paul Assan	Sex: M/M, Age: 41/45, Ethnicity: fanti/fanti, Chd: 5/5 Chd at sch: 5/2, Both married, Other occupation: mason/mason, Food crop farm size: 9/10, Crops: m/m, Tree crop: 1 acre cashew/none, Livestock: 1 goat & 3 sheep/none, Land ownership: family & Hired/Hired, Land tenure: free & cash/cash, Labour: h, s, f/h, s, Housing: own/co-owner, Bank account: Swedru rural bank/none, Remittance:none/none
Emmanuel Arthur Simpson	Adam Kofi Sam	Sex: M/M, Age:65/55, Ethnicity: fanti/fanti, Chd:12/13, Chd at sch:2/2, Both married, Other occupation: trading/none, Food farm size: 2/9, Crops: m, c/m, c, Tree crop: 1 acre cashew/2 acre cashew & 8 acre cocoa, Livestock: 8 goats/12 goats, Labour: h, s, f/h, s, f, Land ownership: Hired/own & hired, Land tenure: cash/free and cash, Housing: own/mother, Bank account: Agona rural bank in Swedru/none, Other income: pension pay/none, Remittances: none/children
Bashiru Entsil	Benjamin Gurah	Sex: M/M, Age: 40/53, Ethnicity: fanti/fanti, Chd: 15/1, Chd at sch:12/1, Both married, Other occupation: teaching/none, Food crop farm size: 6/9.5, Crops: m, c/m, c, y, p, Treecrop: 6 acre cashew/1acre cashew Labour: h, s, f/h, s, f, Livestock: 11 sheep & 14 goats/14 sheep Land ownership: family & hired/family & hired, Land tenure: free & cash/free & cash, Housing: own/family, Bank account: akyempim/akyempim, Remittances: none/none

5.4 Monitoring programme

5.4.1 Developing a multi-method approach

The monitoring programme maintained and expanded on the multi-method approach we had established during the baseline studies.

5.4.2 IMT diaries and village removal records

Diaries of use were kept (in alternate months) by those who had obtained IMTs through the project. The diaries show that the IMTs were used only very occasionally in a month for some purposes (notably clinic visits), but for other purposes was used up to 31 days per month. Maximum days that equipment was used per month for different purposes is shown below, in rank order.

Maximum days equipment type used per month, in rank order

Use type	**Project IMTs: maximum number of days used per month for purpose indicated (and modes of transport utilized in order of importance)**
Social visit outside village	31 (bicycle)
Transport of building materials	25 (push truck, wheelbarrow, power tiller)
To school	20 (bicycle)
Transporting produce from farm	18 (push truck, power tiller, cycle)
Collecting water	17 (push truck, hand cart, power tiller)
To process or grind food	13 (push truck, hand cart, wheelbarrow, cycle)
Transport of input from village to farm	12 (push truck, cycle, hand cart, power tiller)
Collecting firewood	10 (power tiller, push truck, hand cart, wheelbarrow)
Leisure ride	9 (cycle, push truck, handcart, wheelbarrow)**
Visit to junction	6 (cycle, push truck, handcart, power tiller)
Hunting trip	6 (cycle, push truck, handcart)
Social visit inside village	6 (cycle, push truck, handcart)
Transport produce from village to market	5 (push truck, power tiller, cycle)
Transport of input from market to village	5 (push truck, cycle, power tiller)
To clinic	1 (cycle, push truck)

** Mostly cycles, but the other items are used by children for playing games.

This table is self explanatory, but emphasizes the diversity of uses to which the IMTs are put, and the fact that use of IMTs for journeys with produce to market are far outnumbered by journeys for other purposes. The most regular direct agricultural usage for the IMTs is for transport of produce from farm to village.

Villagers who purchased IMTs through the project were required to keep their IMT at night in the village (until monitoring was completed), so that monitoring could take place. Some items of equipment – notably push trucks – were removed to nearby markets, where they could be hired out and the owners may have sometimes recorded that they had not been used (trying to hide their absence from project staff in some cases!) Thus the data above is not entirely complete for all equipment acquired through the project.

The diaries emphasise:

- The diversity of uses to which the IMTs are put
- IMTs journeys taking produce to market are far outnumbered by journeys for other purposes.

- The most regular direct agricultural usage for IMTs is produce transport from farm to village. [Interviews also picked up the fact that IMTs were often used to transport goods between the home or granary and the lorry park.]

The following tables provide details of absent project IMTs at two points when inventories were undertaken by project staff during the monitoring period.

Absent equipment: 30th May 01

Village	Beneficiary and equipment type	Location of IMT	Date of transferral	Details
Sampa	Solomon Djan (push truck)	Ingiresi	1st week of February	Somebody came to hire the truck to convey blocks at Ingiresi. It has been staying there for conveying construction materials. A young man is taking care of it and shelters the truck. He is the person operating it.
Sampa	Kofi Menko (wheelbarrow)	Gomoa-Mankessim	Last week of April	He is a mason and is currently building there. The wheelbarrow goes with him wherever he is contracted for work.
Abora	Esi Kwagyirba (push truck)	Ankamu junction	1st week of April	She gave the truck to someone at the junction to operate it there for her. He was expected to pay her a fee. This person has left Ankamu, but the truck was not collected and brought back to Abora yet.
Lome	Akua Aframah (push truck)	Nduan	Last week of April	Akua is constructing a house there. An aunt of Akua is staying at the junction and taking care of the truck.
Adabra	Kwame Botwe (push truck)	Bontroase	Early-mid April	The truck was parked in front of the house here in Adabra and the children were playing with it, loosening the tyres. That's why I took it out and gave it to my brother. I told him to put it down and wait until harvest. There is also no work there, so he just keeps it safe for me. I will bring it back. But since the children were spoiling it, hat's why I gave it to my brother until the harvest period.
Adabra	Adwoa Nyarkoa (push truck)	Okuarse	End of March	She is working in that village, processing gari. She has taken the truck with her to work over there. She wanted to use it to convey cassava for gari processing. When she comes back, she will bring the truck with her. (on our last visit, she was back in the village, but the truck wasn't.)

Adabra	Joyce Agbeshi (push truck)	Kasoa	1st week of April	
Adabra	E.K.V. (bicycle)	Buduatta junction	Soon after IMT delivery	Her brother is taking care of it. E.K.V. said the brother is using to harvest cassava. She told the teacher that he is hiring it to people as service and who want to ride it as leisure. (according to the teacher, it was the brother who encouraged her to collect the bicycle; brother made first payment)
Adabra	Esi Kygreba (push truck)	Kuma Kope (satellite village)	Beginning of May	
Adabra	Hanah Aduafo (push truck)	Eduafokwa	Middle of April	
Aworabo	Kwaku Djan (wheelbarrow)	Agona Kyanyako	Soon after IMT delivery	He is building a house there and is using it for construction. When it is finished, he will bring it back
Aworabo	Grace Djan (wheelbarrow)	Agona Kyanyako	Soon after IMT delivery	Same as for Kwaku Djan
Aworabo	Kwabena Boako (push truck)	Akyim Swedru	Soon after IMT delivery	Using it for commercial purposes, hiring it to people.

Absent equipment: October 2001

Village	**Beneficiary and equipment type**	**Location of IMT**	**Date of transferral**	**Details**
Sampa	Solomon Djan (push truck)	Ingiresi	1st week of February	Somebody came to hire the truck to convey blocks at Ingiresi. It has been staying there for conveying construction materials. A young man is taking care of it and shelters the truck. He is the person operating it.
Sampa	Kofi Menko (wheelbarrow)	Gomoa-Mankessim	Last week of April	He is a mason and is currently building there. The wheelbarrow goes with him wherever he is contracted for work.
Abora	Esi Kwagyirba (push truck)	Ankamu junction Abora	1st week of April June	She gave the truck to someone at the junction to operate it there for her. He was expected to pay her a fee. This person has left Ankamu, but the truck was not collected and brought back to Abora yet. The truck was brought back to Abora after operators in Ankamu did not hand over money from hiring activities
Abora	Kojo Ayitey (push truck)	Ankamu junction		
Lome	Akua Aframah (push truck)	Nduan	Last week of April	Akua is constructing a house there. An aunt of Akua is staying at the junction and

				taking care of the truck.
Adabra	Kwame Botwe (push truck)	Bontroase	Early-mid April	The truck was parked in front of the house here in Adabra and the children were playing with it, loosening the tyres. That's why I took it out and gave it to my brother. I told him to put it down and wait until harvest. There is also no work there, so he just keeps it safe for me. I will bring it back. But since the children were spoiling it, hat's why I gave it to my brother until the harvest period.
Adabra	Adwoa Nyarkoa (push truck)	Okuarse	End of March	She is working in that village, processing gari. She has taken the truck with her to work over there. She wanted to use it to convey cassava for gari processing. When she comes back, she will bring the truck with her. (on our last visit, she was back in the village, but the truck wasn't.)
Adabra	Joyce Agbeshi (push truck)	Kasoa	1st week of April	
Adabra	E.K.V. (bicycle)	Buduatta junction	Soon after IMT delivery	Her brother is taking care of it. E.K.V. said the brother is using to harvest cassava. She told the teacher that he is hiring it to people as service and who want to ride it as leisure. (according to the teacher, it was the brother who encouraged her to collect the bicycle; brother made first payment)
Adabra	Esi Kygreba (push truck)	Kuma Kope (satellite village)	Beginning of May	
Adabra	Hanah Aduafo (push truck)	Eduafokwa	Middle of April	
Aworabo	Kwaku Djan (wheel barrow)	Agona Kyanyako	Soon after IMT delivery	He is building a house there and is using it for construction. When it is finished, he will bring it back
Aworabo	Grace Djan (wheel barrow)	Agona Kyanyako	Soon after IMT delivery	Same as for Kwaku Djan
Aworabo	Kwabena Boako (push truck0	Akyim Swedru	Soon after IMT delivery	Using it for commercial purposes, hiring it to people.
Aworabo	John Appiah (push truck)	Kasoa	June	We bought the truck purposely for the harvest of cassava and cocoa, but it is not yet time for cocoa season. My brother in Kasoa came for it and promised to bring it in the cocoa-season. It's been about 2 months now that it is in Kasoa.

Once the final workshop had taken place owners were allowed to take their equipment elsewhere to earn money, if they so wished, in order to enable them to complete their loan repayments (which some argued would be easier if they could earn money from using or hiring out the equipment in nearby markets). The degree to which equipment was removed to other locations varied between villages and equipment type as the following table indicates. The push trucks were the item most commonly removed because they could be hired out in busy market centres. Cycles were very rarely removed.

Comparison of absent equipment, October 2001 and April 2003

Village	Absent equipment Oct 2001	Absent equipment April 2003
Sampa	1 out of 5 push trucks, 1 out of 3 wheelbarrows	Nil
Abora	2 out of 3 push trucks	2 out of 3 push trucks
Lome	1 out of 13 push trucks	2 out of 13 push trucks
Adabra	5 out of 12 push trucks, 1 out of 3 bicycles	5 out of 12 push trucks
Assin- Aworabo	2 out of 11 push trucks, 2 out of 4 wheelbarrows	8 out of 11 push trucks, 2 out of 12 bicycles

The IMT diaries record usage separately for the owner, family use and hiring out. IMT hiring within the village is negligible, according to the data recorded, except for transport of building materials, water and to a lesser extent agricultural produce (using the power tiller and push trucks). Equipment was never hired out for travel to school or leisure riding and only a few cases are recorded for social travel outside the village, presumably because of fears that the equipment would not be returned on longer journeys or could be damaged by children.

Although hiring frequency is generally far lower than own usage, according to the diaries, other villagers suggested that in some cases our respondents conveniently underestimated the extent of hiring in discussions with project staff, because they did not wish to reveal the extent of their earnings. This was reportedly particularly likely in the case of the power tillers and push trucks. One of the push truck owners at Aworabo (Kwabena Boako) took his truck to Akim Swedru soon after it was delivered and has been hiring it out there ever since, according to other villagers. Kwabena states, *'I have not received a cedi from my push truck based at Akim Swedru ever since I took it there'*, yet one of his friends reported that he had witnessed the caretaker at Swedru paying over his receipts to Kwabena on two occasions. The other push trucks are hired out in Aworabo at 15,000 to 30,000 cedis per day (April 2003), depending on duration of hire.

General conclusions regarding IMT hire:

- IMT hiring within the village is negligible, except for transport of building materials, water and to a lesser extent agricultural produce (using power tiller and push trucks).
- The push trucks were the item most commonly removed because they could be hired out in busy market centres.
- Cycles were very rarely removed.

5.4.3.Farm surveys (agricultural production and marketing)

This section picks out selected farm characteristics where comparison of baseline (September 2000) and end surveys (March/April 2002) have been made and considers the potential impact of IMTs on observed change, in part through comparison of

changes within control and beneficiary groups. However, it is important to note that control group members were also, in some cases, able to borrow or loan IMTs from fellow villagers. Moreover, only limited change would be expected in the first year of the introductions. Analysis of impact through farm survey, in particular, would benefit from repetition and review with beneficiary and control groups over a period of years.

Of particular interest is *change in farm location*, since it might be expected that IMT owners would possibly move their farms to obtain better access to IMT-trafficable routes. However, this is complicated by factors such as the need to allow fallowing, landlord regulation following expiry of current tenancy/tenure arrangement, soil fertility patterns and suitability of land for a particular crop. In total, eight beneficiaries and one control group member said they had specifically changed farm location because of their IMTs. In Lome this included 3 beneficiaries and one control group member. All the beneficiaries were push truck owners who wished to load their trucks at the farm and had selected more accessible farm locations for the truck. At Adabra there were also 3 out of 15 beneficiaries, and at Sampa and Abora one beneficiary each. Qualitative information, collected at the time of the farm surveys provides additional information on these moves: thus, for instance, Efua Terbah, a woman truck owner at Lome observed: *'I made one farm in front of the unbridged stream so that I can take the push truck there to convey produce'* (interview, February 2002). Isaac Nyarko, another beneficiary, noted: '*I now farm at a far place because the push truck can convey a lot over the distance. Also [I] made the farm at the roadside so that the push truck can easily go there*' (interview, March 2002).

Total area cultivated is another important area for investigation, since an increased use of IMTs could arguably reduce labour requirements for transporting and thus allow its reallocation to increased production. Improved transport could also be expected to encourage expansion in overall production. The data can not be wholly conclusive. Nonetheless, it suggests a change towards increased production, for a majority of farmers. Overall, however, there is a slightly stronger tendency to increased production among the control than among the beneficiary group, though this is a feature of only two of the settlements, Lome and Abora. At Adabra and Sampa slightly more beneficiaries than control increased production. It is important to bear in mind, however, that some control group members borrowed/hired IMTs from time to time. Analysis by gender suggested increases were more frequent among women (66% increased the area they farmed) than men (57%) and this may be particularly significant, since it is normally women who bear the brunt of transport demands. The only village in which male farm expansion was greater than female farm expansion was Sampa, where project IMT uptake was lowest.

Cultivated area in 2002 in comparison with previous year:

Total area under production compared to previous year	**Lome Bene-ficiary**	**Lome Control**	**Abora Bene-ficiary**	**Abora Control**	**Sampa Bene-ficiary**	**Sampa Control**	**Adabra Bene-ficiary**	**Adabra Control**	**Total Bene-ficiary**	**Total Control**
Bigger	8 53.3%	10 66.7%	6 60.0%	8 80%	5 83.3%	3 50%	9 60%	8 53.3%	28 60.9%	29 63%
No change	2 13.3.%	0 0%	0 0%	0 0%	0 0%	1 16.7%	1 6.7%	3 20%	3 6.5%	4 8.7%
Smaller	5 33.3%	5 33.3%	4 40%	2 20%	1 16.7%	2 33.3%	5 33.3%	4 26.7%	15 32.6%	13 28.3%
Total	15	125	10	6	6	15	15	46	46	46

Discussion with respondents suggested a wide range of reasons for increasing the area of production, including availability of funds (in occasional cases through external remittances, sometimes through good yields the previous year), availability of labour, availability of land, expectation of good rains, time available, introduction of an additional crop to aid diversification (such as pepper), and concerns around food security.

Of these, the labour factor, in particular, may link directly or indirectly to increased availability of IMTs in the settlement, since this can free up labour for land clearance and other tasks. A number of people referred to easier access to labour (especially women) which suggests a possible link to IMTs. Panin Gyasi, an elderly man and control group member at Lome, for instance, observed: '*I had more people in the village who helped me in the initial clearing this year than last year*.' A women beneficiary at Abora, Akua Ayindah, states: ' *This year I was able to get labour early for the initial clearing, whereas I could not get labour last year. Last year I delayed the clearing. It is better to start early when labourers are free.*' (This latter statement refers to timing, of course, rather than overall availability of labour.) So, although only 8 respondents directly attributed their increased production to IMTs, it is possible that some of the evident improved access to labour can be related also to IMT availability in the settlement as a whole.

The eight respondents who made direct links to IMT (mostly push truck) availability included 7 beneficiaries and one (female) control group member. Bashiru Entsil, a male beneficiary at Lome, for instance stated: '*with the push truck I could convey a lot of produce and inputs at a time. I can therefore save some time to do more work at farm*.' At Abora, one of the women beneficiaries observed that the availability of the power tiller to take harvested produce to market when no conventional vehicle was available also encouraged her to make a larger farm.

Changes in *pattern of cropping* were also examined: it could be hypothesized, for instance, that an increase in a very heavy crop like cassava might be encouraged by IMT availability. In fact, some increase seems to have occurred in both maize and cassava cultivation, across both beneficiary and control groups, though with higher increases recorded for maize. For example, the proportion of plots under maize monoculture increased from 11.5% in the baseline survey to 18.7% in 2002, while cassava monoculture increased from 12.3% of plots to 15.3%. Data on distribution of crops by

distance from the village indicates that there was a greater tendency for an expansion of cassava in plots closer to the village, and a decline (with replacement by maize) in more distant plots. This may be related to better IMT access to fields closer to the village. Eight beneficiaries in the survey said they had increased their range of crops because of IMT availability in the village.

More detail regarding the complex decisions which farmers make and the way transport impacts on those decisions is available from qualitative data gathered through the project and in the final village workshops, where impact of IMTs on agricultural production and marketing was specifically debated. This discussion is extended in a Masters thesis in preparation by Frank Owusu Acheampong.

General conclusions from the overview farm survey in March/April 2002, and comparison with the baseline farm survey in 2000, are as follows:

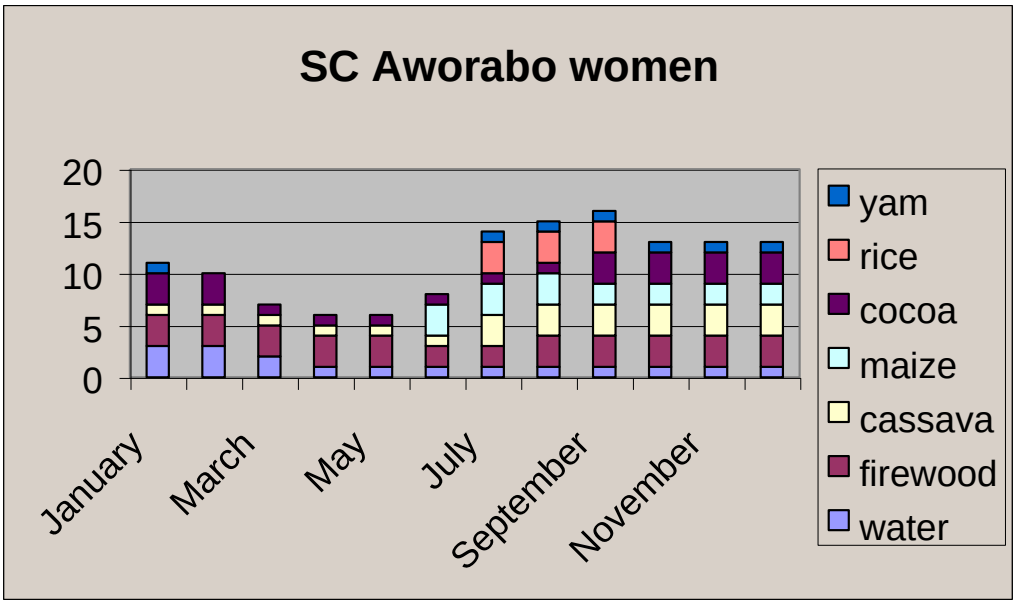
- 8 beneficiaries and one control group member said they had specifically changed their farm locations because of the IMTs: all were push truck owners.
- The data suggests a change towards increased production, for a majority of farmers (i.e. both beneficiary and control. N.B. some control group members borrowed/hired IMTs.)
- Analysis by gender suggested increases were more frequent among women (66% increased the area they farmed) than men (57%). This may be significant, since it is normally women who bear the brunt of transport demands. The only village in which male farm expansion was greater than female farm expansion was Sampa, where project IMT uptake was lowest.
- Discussion with respondents suggested a wide range of reasons for increased production, including availability of funds, labour and land, expectation of good rains, time available, introduction of an additional crop to aid diversification (such as pepper), and concerns around food security.
- 8 respondents directly attributed their increased production to IMT (mostly push truck) availability. This included 7 beneficiaries and one (female) control group member.
- It is possible that some of the evident improved access to labour can be related to IMT availability since this can free up labour for land clearance and other tasks.

5.4.4 PRA (Seasonal headloading and conventional transport availability calendars)

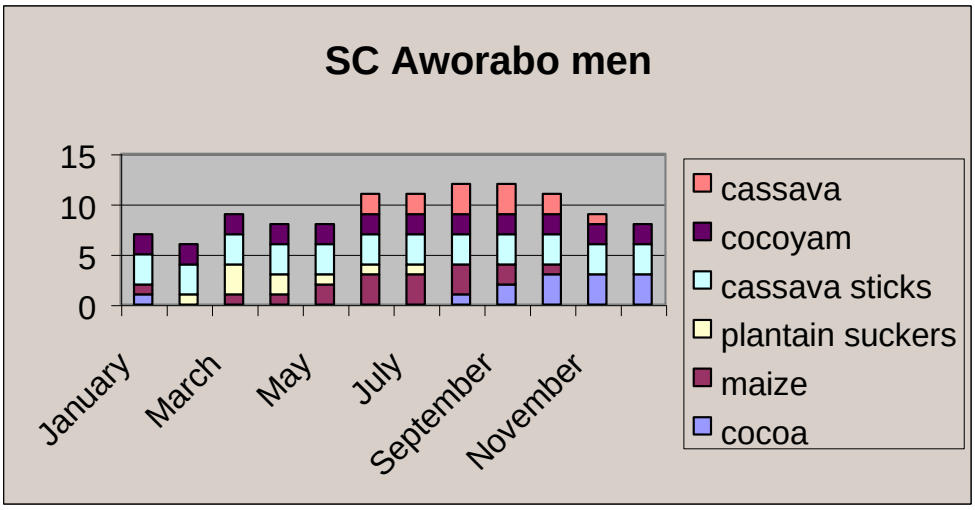
Data for the compilation of seasonal headloading calendars was collected in August 2001 and again in July 2002, in order to try to assess whether – at the same time of year – there had been any change in perceived loads because of the introduction of IMTs. A full report of this activity is available, with the participant commentaries which accompanied the compilation of each chart. For the current report the tables are presented with a very brief review of conclusions reached. Numbers on the vertical axis refer to the total number of stones allocated to headloading tasks in a particular month and are clearly highly subjective, merely allowing broad within group comparison of seasonal change. A seasonal calendar of perceived conventional transport availability is also included. Each village is discussed in turn**.**

Assin- Aworabo

*Women's group 2001***:** [3-6 women, mostly in their 20s and 30s, but one older lady and one mid-aged]



Aworabo men 2001 [3-4 men present with one dominating, who is mainly a chainsaw business person, but farms a little]



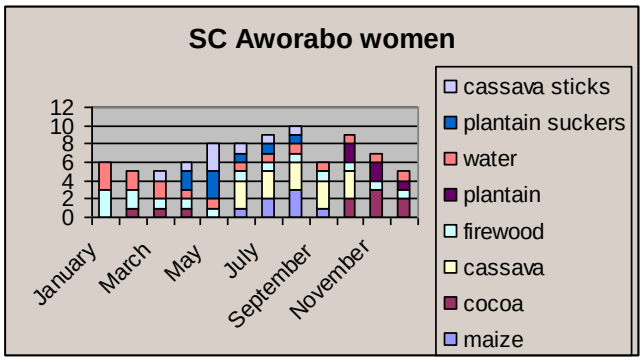
The two charts above suggest that women perceive themselves to have greater variation in load carrying duties than men through the year, with the peak demand for carrying in September when cocoa harvesting has commenced. March to July represent the least

demanding months in terms of headloading because this is the period prior to the main harvesting seasons. The cassava harvest in Assin-Aworabo area is July-December, maize from June onwards, cocoa from September, rice is July onwards.

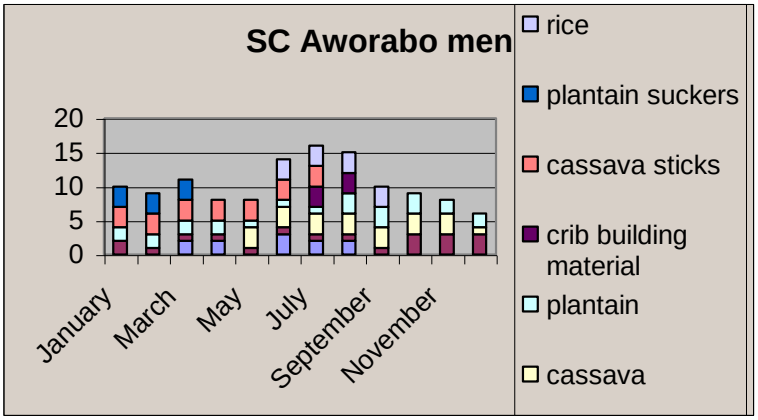
Men carry a smaller range of produce: they do not normally carry fuel wood, water or rice. Women in the household are expected to bring the fuelwood and water, though additional women may be hired to harvest and carry rice during the rice harvest. However, men will carry inputs, notably cassava sticks and plantain suckers to the fields.

When the exercise was repeated in July 2002, women indicated additional tasks among their important headloading duties - cassava sticks, plantain suckers – these seem to have simply been missed out the previous year. Some women remarked on how load carrying for cocoa, maize and cassava and even fuelwood had been reduced for some women over the past year, due to the presence of the power tiller and trucks in the village. However, some said the tiller was too expensive to make use of and that it could not reach many farms. The trucks, it was remarked, principally benefited those who owned them and the wives of men who owned them, if there were good paths to their farms. IMTs were not used to carry plantain or water.

Aworabo women 2002

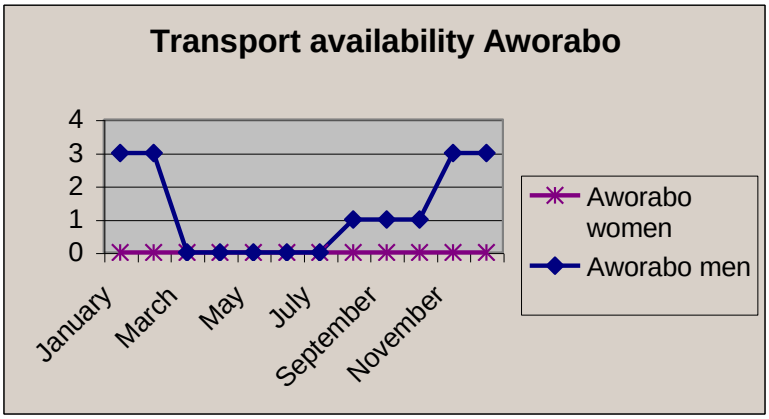


Aworabo men [3 men] 2002



The Aworabo men's chart in 2002 indicates a more varied load carrying pattern across the year than in 2001. They suggested when compiling the chart that IMTs had led to a substantial reduction in maize carrying (and thus reduced the stones allocated to this task from three to two) and some reduction in cocoa carrying for men; a few people with distant farms had also used the power tiller to carry cassava and rice.

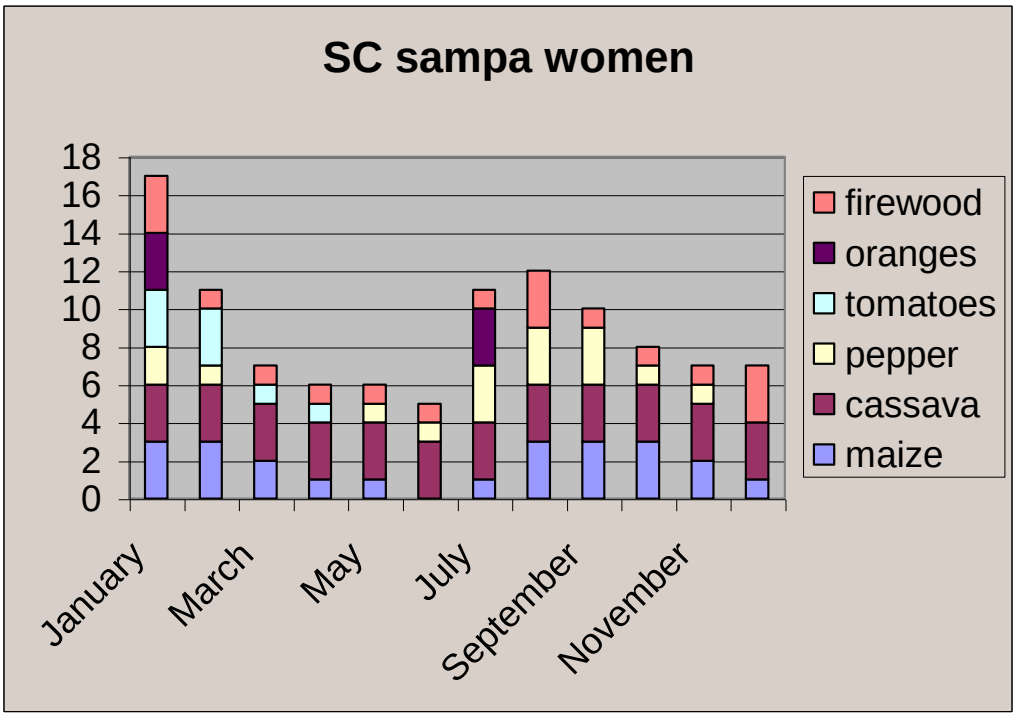
Aworabo conventional transport availability chart, 2001.



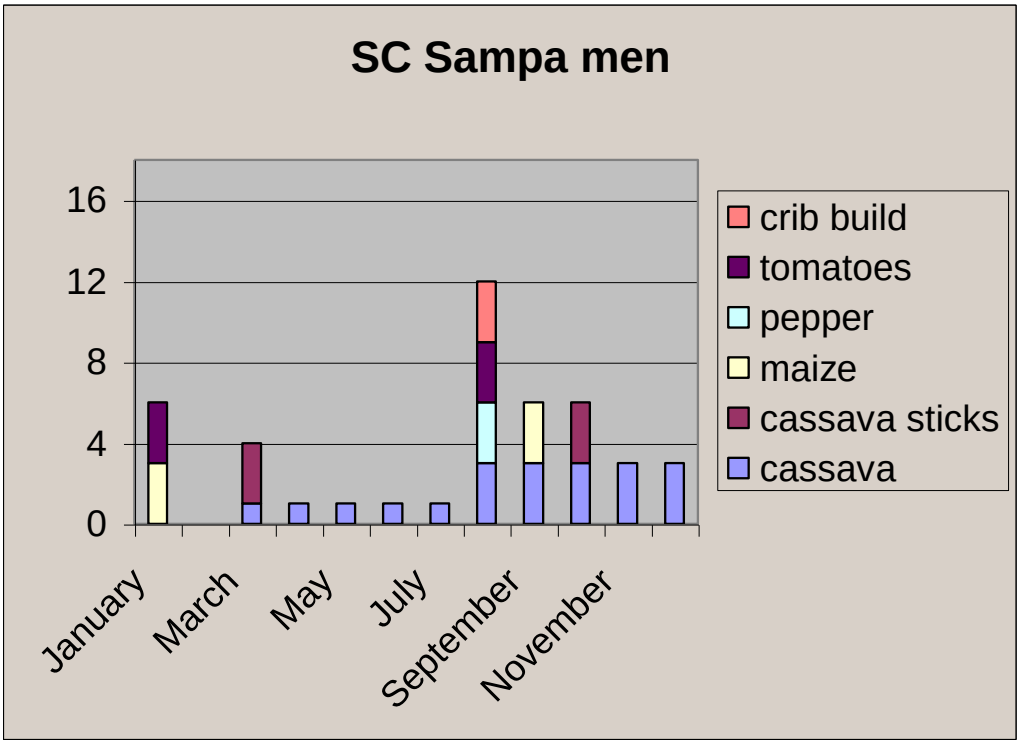
The conventional transport availability chart was compiled for a women's group and a men's group (each of 2-5 persons) using stones with stones representing how easy it is to obtain transport at different times of year. Charts for 2001 and 2002 were similar. Men emphasise the relative availability of transport in the Christmas festival and cocoa harvest periods when the roads are also relatively dry. During the rice harvest, in January-February, power tillers reportedly travel to the village from Oda market in Eastern Region. It is much more difficult to get cars in the rainy season, especially June-July when the roads become slippy and sometimes impassable. Women also observe that there is a change in frequency between transport availability in the dry and wet seasons, but argue that since they cannot access it, it does not count.

Gomoa- Sampa

Sampa women, 2001[group of 4-6 women; many people passing stopped and commented occasionally]



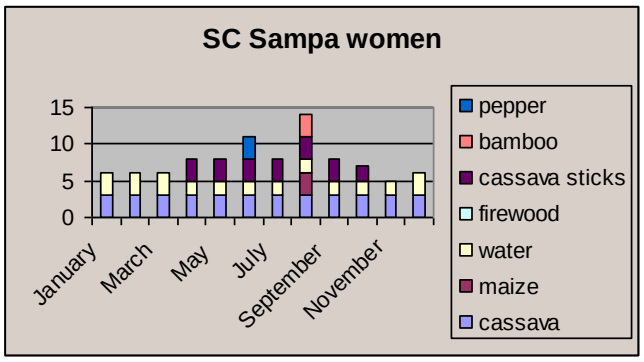
Sampa Men's group, 2001 [3-5 men present, but mostly disinterested. The activity was dominated by one man]



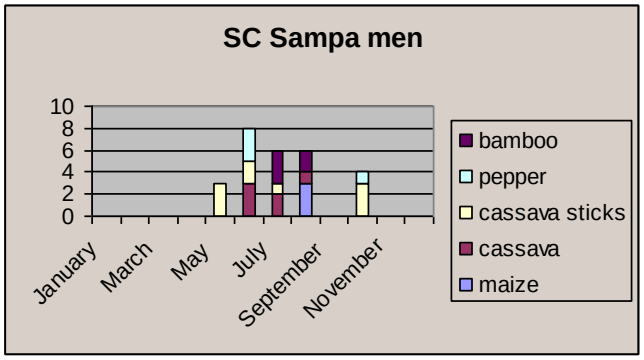
In 2001 Gomoa-Sampa women indicated through this exercise that their main headloading duties had two peaks, one in January, another in July-September. The January peak is closely linked to the need to take dried maize and cassava to market for sale, following the Christmas festival. Many women in this village carry their maize to the junction, or the 5 miles to the nearest market (Kyiren Kkwanta). The July-September peak is linked to the new maize harvest, and to pepper harvesting.

The male calendar indicates much less headloading overall, with the emphasis principally on carrying cassava through most of the year. There is a clear peak to their headloading duties in August when much cassava is harvested in this district, but some carrying also in January for tomatoes and maize.

Sampa women 2002: Adjoa Krampah and 4 women



Sampa men 2002 [4 men]

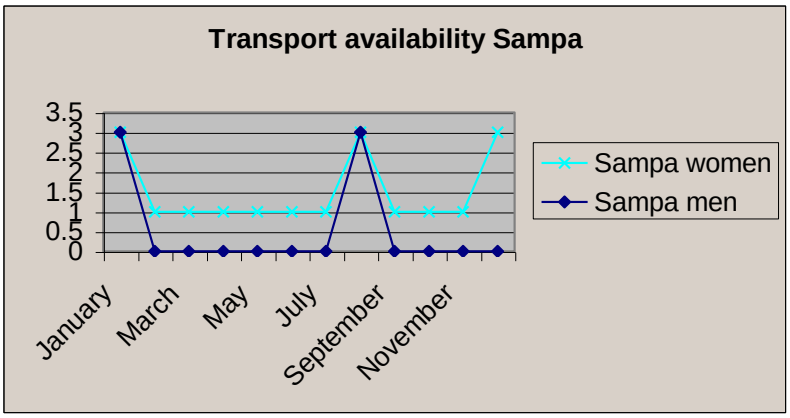


The 2002 Sampa calendars show slightly different carrying patterns. Women's load carrying looks roughly similar over the year, apart from an absence of the January peak of 2001. This maybe because discussion about festivals was very limited among participants of this particular group and thus the Christmas festival peak was ignored by women (though it was emphasised in 2002 by the men's group and thus clearly took place as usual.) The men's 2002 calendar omits any carrying of maize and tomatoes in January, though their discussion suggests harvesting of these crops took place as usual.

Clearly, different individuals and groups have different perceptions of the significance of particular activities according to their personal livelihood strategies. This can affect the information recorded in the PRA, as the exercise for Sampa in 2001 and 2002 suggests.

Few IMTs were taken by Sampa residents, and not surprisingly, then, little reference was made regarding their impact on load carrying in 2002. One man observed: '*you cannot use the truck to convey anything from the farm, because there are too many hills and at times you need to cross the river.*' However, one of the women said that, because she was now farming just 30 m from the roadside, she would be using the push truck she had purchased through the project (one of 5 acquired in Sampa), during harvest: '*last year in May, I carried all the crops because the truck could not go to the farm, but this year we farm at the roadside…*'

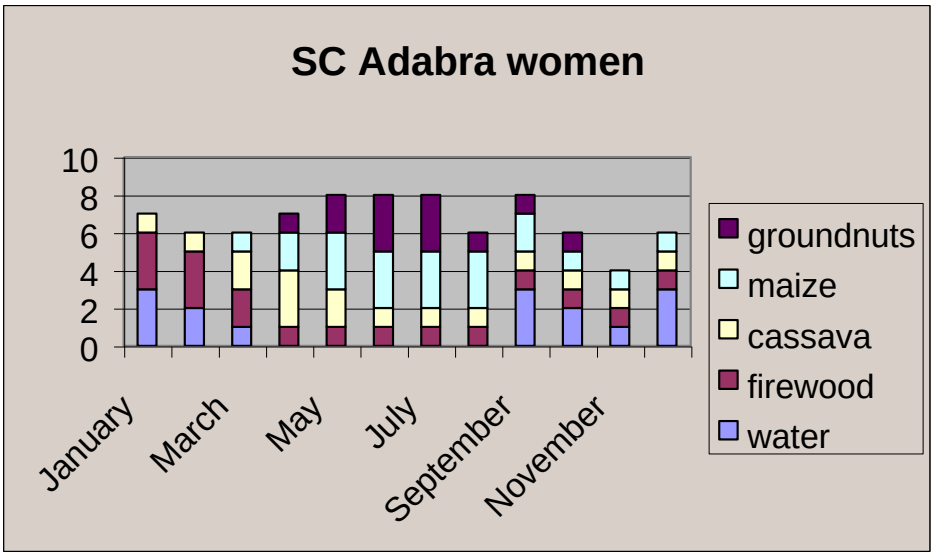
Sampa transport availability chart 2001



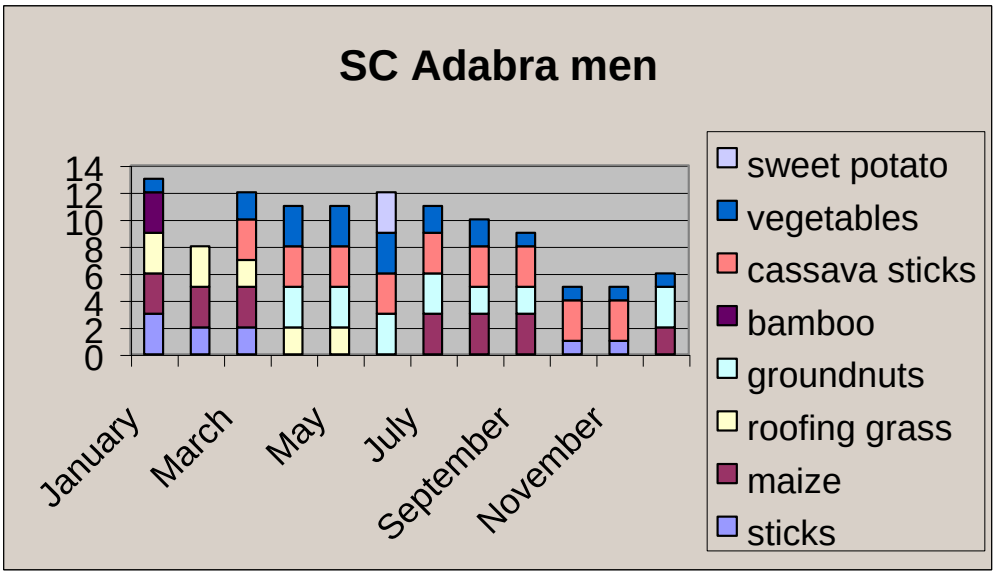
Transport availability is viewed very similarly by the men's and women's groups in Sampa: peaks in availability around the Christmas festival season, and again in the August festival season. Since the initial study of this village in R7149, the road had been substantially improved by grading: consequently transport into Sampa was relatively easily obtained at the time of the survey: '*There is no difference between the wet and dry season, because now the road is good and on every market day a car is coming'* (men's group). This was echoed by the women's group. By July 2002, however, the grading improvements had disappeared once more: '*Throughout the year transport is not easy, because when we want to travel to any place, we need to walk to far places before we can get a car……The rainy season affects the vehicles. When it rains the [steep] road [leading into the village] becomes slippery and there are many gullies and potholes which the cars cannot pass through. The cars come here, but it is not regular. During the dry season the vehicles come here more often*.' (men's group). Again the men's group's view was echoed by the women's group: however, the men's group tended to have more to say about conventional transport, reflecting their greater potential to pay fares and use it if available.

Gomoa -Adabra

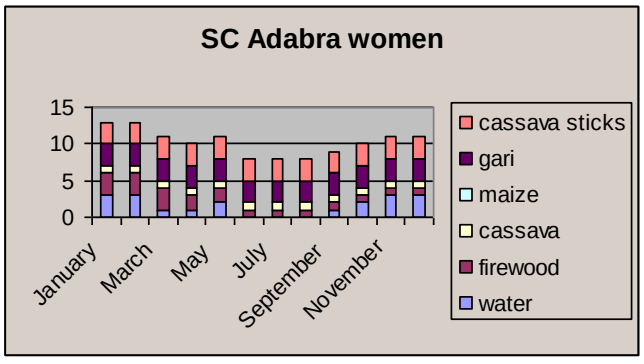
Adabra women 2001[4 women, all Ewe]



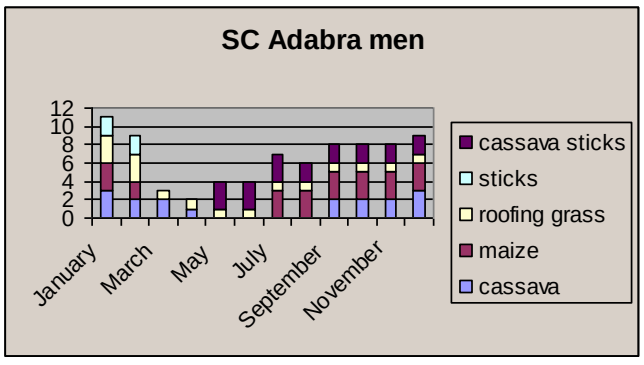
Adabra men 2001: [2-4 men]



Adabra women 2002 [3 women]



Adabra men 2002 [2-5 men]



The Adabra charts show considerable differences between 2001 and 2002 in the overall seasonal carrying burden for both women and men. This partly reflects individual

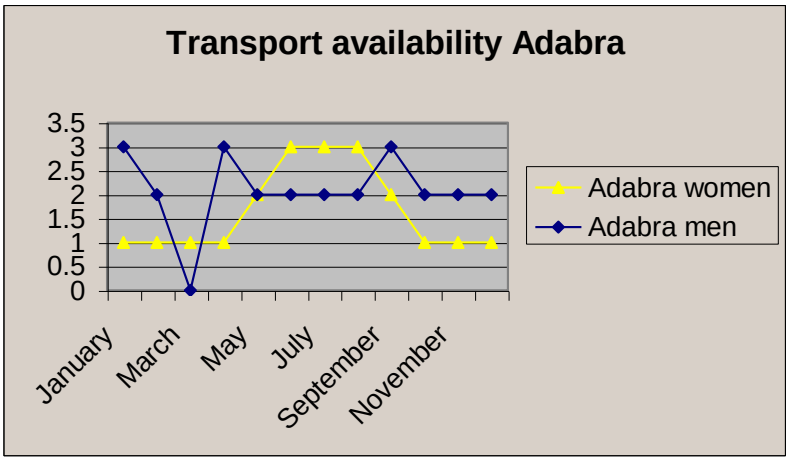
livelihood variations, but interviews in 2002 with Adabra women for the seasonal calendar, in particular, suggest that the push trucks had substantially reduced the carrying burden for cassava and maize:
'*Since we have been using the truck we don't spend much time headloading [cassava], because the truck conveys much for us…in March because of the truck we don't spend time headloading cassava again, we only headload what we will use in the house from nearby farms…. What we will use for processing of dough and gari we don't spend time again on it because of the truck.*'

'Since the truck came many people use the truck to convey maize. And those who don't have access to truck store the maize at the farm and when they need it, they use the truck to convey. If you want to use the truck and the owner is using it, but you need your maize, then you need to find some people to carry it. So at times people headload it. But mostly they use the truck. It is not necessary to put stones because people use truck' (women's group 2002).

However, women's overall loads are indicated to be higher in 2002, because in 2002 although cassava and maize loads are lower, cassava sticks and gari loads are added. It is unclear whether these were simply missed off the 2001 calendar because cassava and maize carrying dominated the discussion at that time.

Men's loads appear lower in 2002 than 2001, but this may be simply because the group composition was different. Nonetheless, men also note the role of the trucks at Adabra in 2002: '*Those having trucks use it when they need much cassava when they process gari. If it is only for food we carry it. From January-December we would not put any stones for those using the truck, because that person does not carry again. The little they eat the children carry.'*

Adabra: Conventional transport, 2001

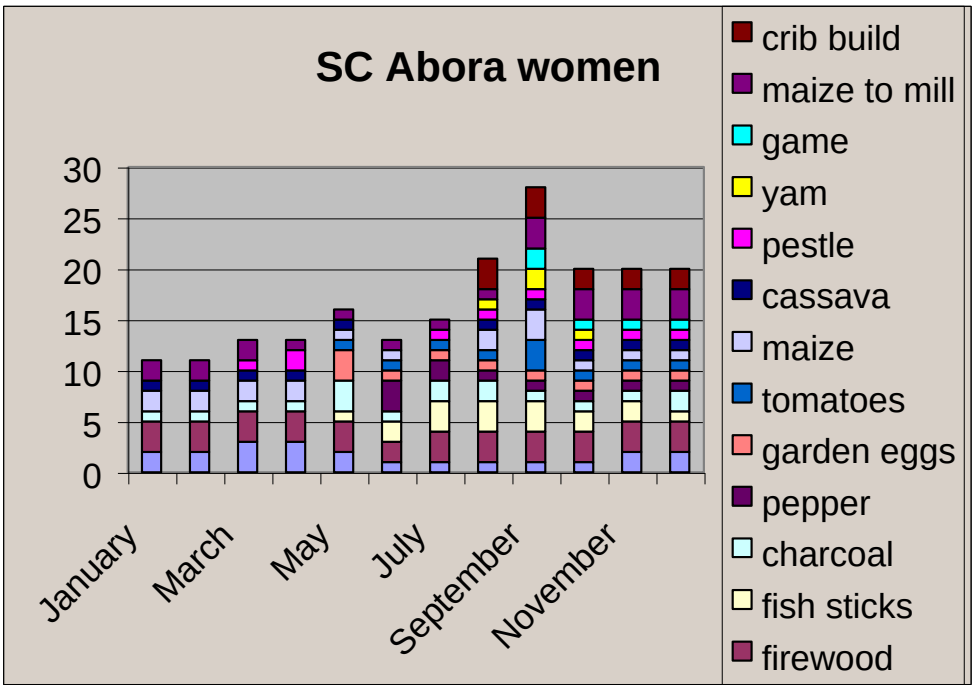


Men and women agree broadly on transport availability. During the harvesting period conventional transport is relatively easy. '*January-March is the farming season and transport is not easy, because they think they won't get loads or passengers [so transporters don't come].*' (Adabra women 2001). However, by the following year, the road had been graded and transport access much improved so that both men's and women's graphs show high access through the year, with no dips: *Vehicles are not very*

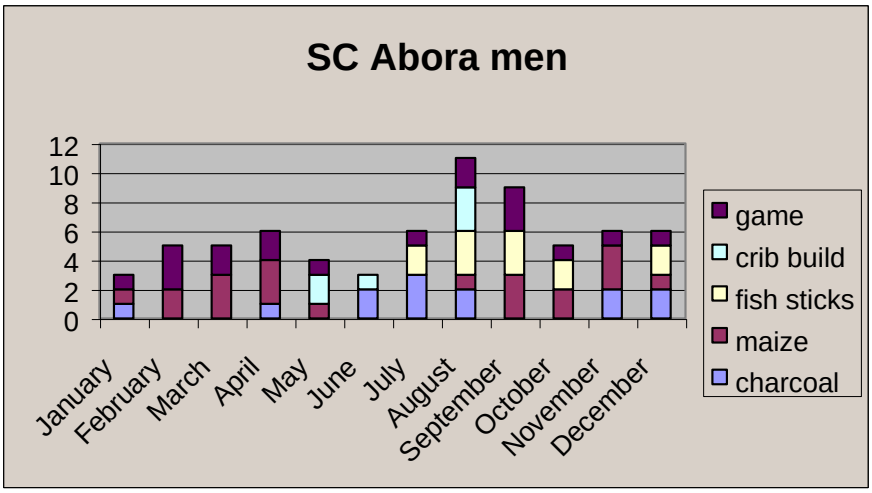
scarce in this area. Anytime you want to travel or send something to the market, you can get a vehicle……. AS at now the road is very fine and previously when the road wasn't in good condition the vehicles became scarce in the rainy season (Adabra men 2002)

Gomoa - Abora

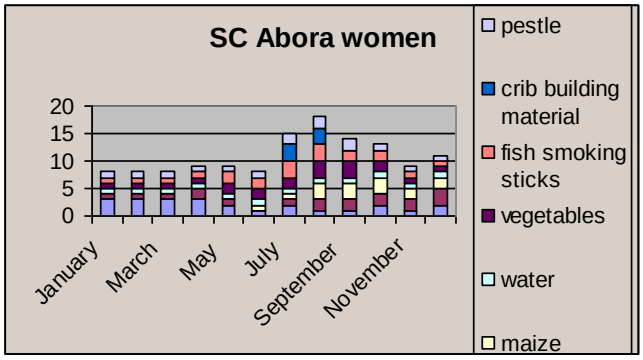
Abora women 2001



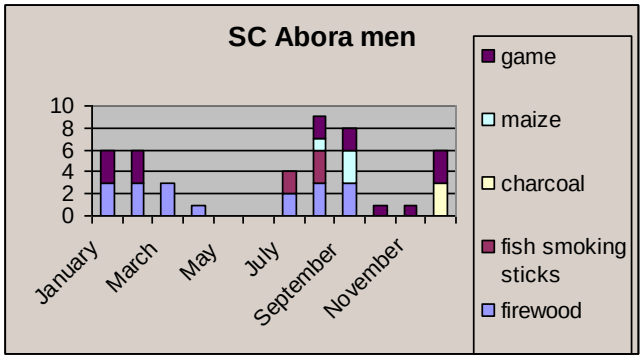
Abora men 2001: [3-4 men, one of them older]



Abora women 2002 [2 women]



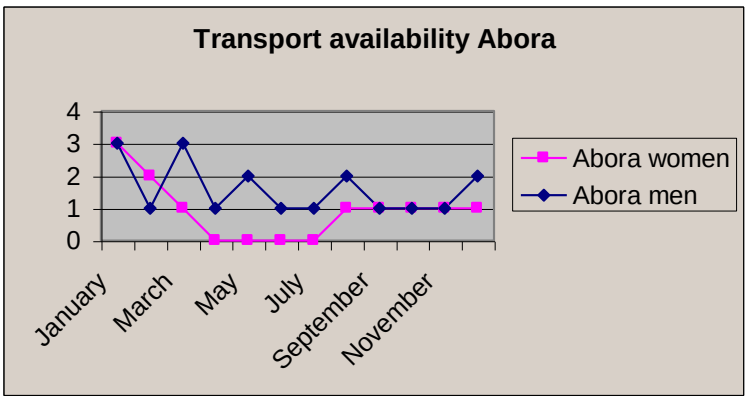
Abora men 2002 [2-3 men]



Variations in Abora seasonal calendars between 2001 and 2002 and the accompanying discussions, like those at Adabra, indicate the impact of IMTs in 2002. In 2001 firewood carrying was a major item for discussion: *Where we fetch firewood it is a long distance, so it takes long. When we go in the morning, we come home in the evening. We*

collect from January until December, except for June, because of the rainy season, there is mud on the road and so we don't go often to fetch firewood. When it rains going to Apam becomes very slippery, so for about one week, we don't go to sell, but we still fetch for home-use (Abora women, 2001). In 2002 the burden was perceived to have reduced substantially because of the availability of IMTs: *From February the power tiller and truck because of the scarcity of water, we use them up to June. From July-December because of the harvesting of maize, pestle and fish smoking sticks, the power tiller and truck work a lot* (Abora women, 2002).
We use the power tiller more than any other transport and it is throughout the year. January-February is the season for firewood, so we use it more. August September is the season for maize. December is the Christmas season, so anything you have you get better prices. It is easy this time to get transport, we have the IMTs in the village (Abora men, 2002.*)*

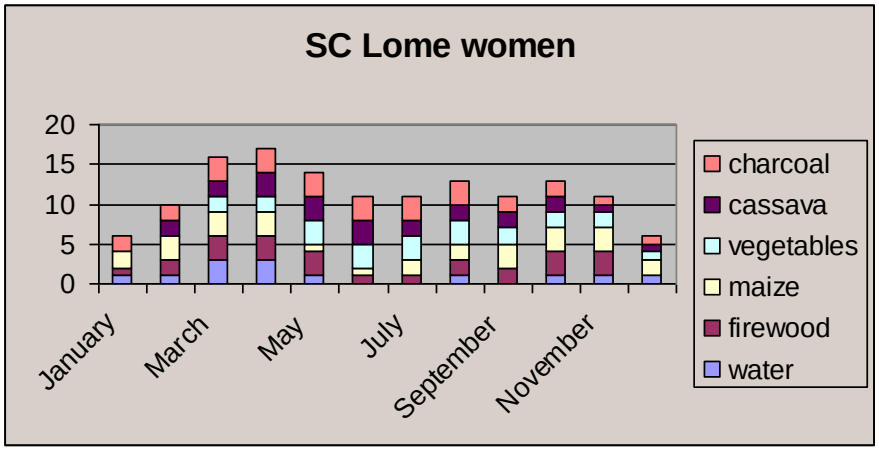
Abora transport chart 2001



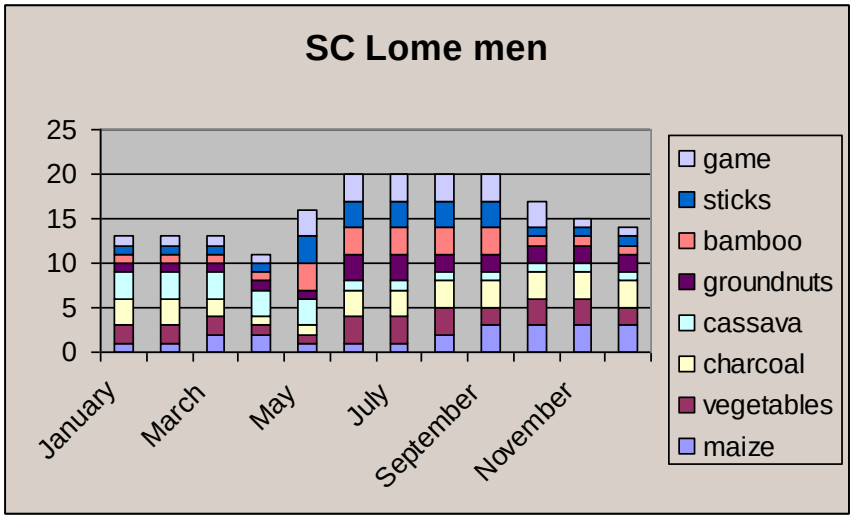
Conventional transport availability in Abora was perceived by both women and men in 2001 to reach its peak in January at the time of the annual festival. At other times, transport was still scarce despite the tarring of the road linking Abora to Ankamu and the main Cape Coast- Accra road, because the road terminates at Abora. By 2002, however, transport access was seen as substantially improved because the power tiller could be used to transport goods to Ankamu.

Gomoa-Lome

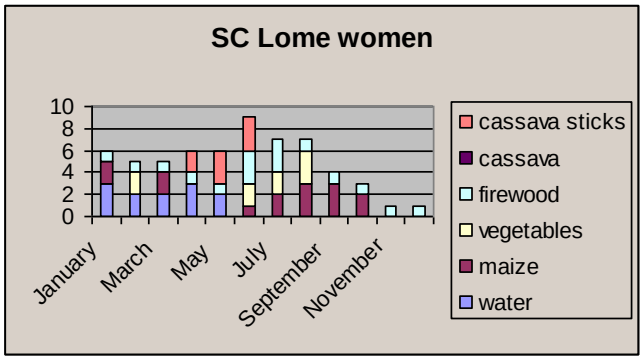
Lome women 2001 [4-5 women at queenmother's house; some more active than others]



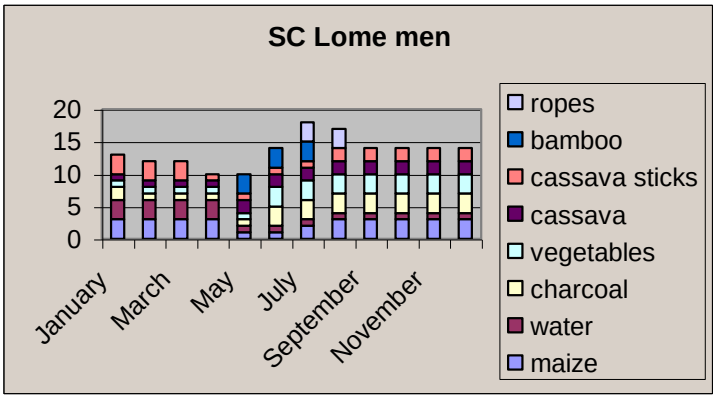
Lome men 2001: [8 men in front of the liquor store]



Lome women 2002 [3-10 at the market]



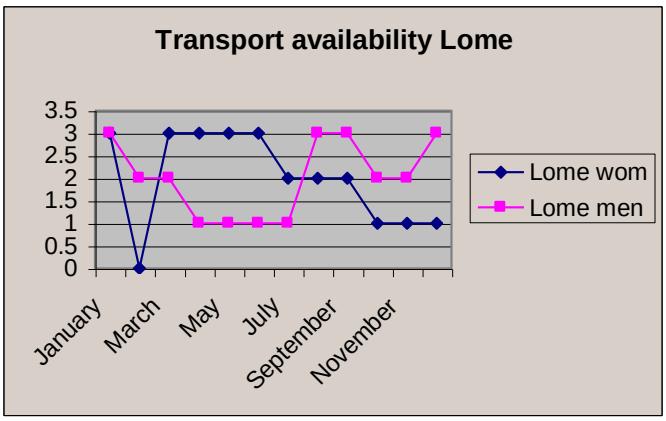
Lome men's group 2002 [4-6 men]



Lome men's and women's carrying calendars and accompanying conversations suggest there may have been some reduction in load carrying between 2001 and 2002, but this is not attributed to IMTs: partly, perhaps, because none of the respondents was an IMT

owner. Lome women's calendar shows a later peak in 2002, with fewer loads particularly in March-May. In 2001 water carrying was a major topic of conversation among the women, although it does not dominate in the calendar, nonetheless this discussion may have helped colour overall load assessment*: In March water was scarce, so we delay at the well before we get some. In April, the times are changing, in some years water becomes scarce and it some years it doesn't become scarce. But especially in March, water becomes scarce, because it is the dry season. In March and April water is scarce, but it sometimes rains in April, so it is average. Sometimes it can get scarce. If the water is scarce we have to walk further and it takes more time. It is far.* (Lome women 2001).

Lome transport chart2001



In Lome women's calendar and associated conversation, 2001, they are talking about availability of transport to themselves, as opposed to transport to the village per se (in the same way women talked in Aworabo). *In February transport is not easy, we don't have anything to sell [so no funds to pay for fares]……. Vegetables spoil easily, but the maize you can store it, that's why transport is easy during the vegetables season. Some come here to buy, but we also send it to the market a lot* (Lome women, 2001). Lome transport availability calendars are fairly similar for 2001 and 2002, though a slight overall improvement was indicated in 2002. Men are more likely to be able to afford transport fares and thus talk about transport in terms of its presence or absence in the village. *From January-March is our festival, so transport is easy here. April-June, until July it is time for farming so everyone is busy, so when the vehicle comes here, it does not get passengers, so it doesn't bother itself to come. In August-December we need to put 3 stones, because many cars come here……. Previously when it rained it was difficult for the cars to come here, but now the road is good, so cars come. It was difficult about 2 years ago. The trucks have not made any difference to the cars coming or to transport* (Lome men 2002).

Conclusions from the village headloading and transport calendars can be summarized as follows:

- Numbers on the graph vertical axis refer to the total number of stones allocated to specific headloading tasks in a particular month by a particular group and are clearly highly subjective, merely allowing broad *within group* comparison of seasonal change. Different individuals with varying livelihood strategies were present in each group and the estimates using stones were inevitably 'broad brush'. Nonetheless, the discussions and graphs were very useful in providing a general picture of seasonal rhythms. To obtain quantitative data (for comparison between years and groups) it would be necessary to select group members very carefully. Ensuring comparability of groups between years could be particularly difficult. Repeat studies with individuals would be more practicable, but the exercise would then lose the advantage of group conversations around load carrying.
- Load carrying peaks vary slightly between villages depending on local activities, but tend to occur in July-September (harvest) and in January (marketing after the Christmas festival.)
- Accompanying group conversations in Aworabo, Adabra and Abora suggest IMTs had made some difference to load carrying in those settlements in 2002.
- Transport availability calendars could change fairly dramatically between years according to whether the access road had been graded or not that year.
- Women have less to say about transport availability because they often lack funds to pay fares.

5.4.5 Gender issues (life histories, in-depth interviews, school studies, observation)

Gender issues regarding mobility, conventional transport and IMT impact were investigated using a range of approaches applied through the monitoring period. Life histories proved most enlightening regarding broader mobility patterns and women's opportunities for decision-making, whereas the in-depth interviews focused on the specific impact of IMTs on gender relationships in the survey villages. Our aim was to assess whether having an IMT project aimed principally at women would lead to antagonism from men and/or changing gender relationships. School studies focused on gendered attitudes to bicycle riding and conventional travel patterns among schoolchildren.

Life histories

Life histories were normally conducted over two, three or four interviews with older people in the villages, selected from a diversity of backgrounds and according to willingness to participate. All were farmers and all the women traded to some extent in farm produce. Additional occupations are indicated below. The discussions tended to revolve around migration history, family relationships and decision-making.

Village name	**Life histories with women**	**Life histories with men**
Gomoa-Abora	Amma Anoaba * Nana Quansemeh Patience Sam (ADRA motivator)* Adjua Jedua	Nana* (Chief of Abora)

Gomoa-Adabra	Mama Blewusi Adwoa Nyarkoa Adoezer Xetologo	Mr Odum*
Gomoa-Lome	Abena Donkoh* Adjoa Sekyiwa (TBA) Oheba Dede (Queen mother) Mary Addaei (priestess) Ekua Aframah Ayuba Akwasi Atiwa	Kofi Peter Charles Turkson
Gomoa-Sampa	Mother of Solomon Djan Ekua Ketuwah Amma Trader Kweku Bensi's wife Mother of Amma	Eduard Abeka Dakosta Kweku Bensi (basket maker) Nana Asare's brother
Assin-Aworabo	Mr Oduro's mother Abena Maanan Adjoa Ahenima Abena Anoa Yaa Serwaa	Kwaku Donkoh Kwesi Sekyi

* indicates owner of project IMT

One of the significant findings from the life histories was the extent to which respondents had migrated in their lives (temporarily and permanently), as children accompanying their parents or relatives, in the case of men for employment or to farm land on their own account (particularly cocoa), in the case of women following their husbands (most of the respondents had lived with a number of partners due to divorce or death of a partner). Additionally, some women have traveled extensively on trading expeditions. Most of the migration related to southern Ghana, including Ashanti and Brong Ahafo Regions but some men and women had lived outside Ghana, in one case in Nigeria and Chad, more commonly down the coast in Cote d'Ivoire: this is clearly not uncommon in the study villages.

The life histories also draw attention to the very large extent to which women follow their husbands and do their husband's bidding, so long as he provides for them and their children. However, failure to do so commonly results in divorce.

In-depth interviews

The more general in-depth interviews with women and men conducted throughout the monitoring period supported and extended our conclusions from the life histories. A continual theme was the contentious nature of women's mobility and its impact on gender relations:

'I think a woman who travels a lot is befriending other men and that's why she travels.' (Men's group, Sampa, March 2002).

'*She travelled to a place and returned and then within the same week she wanted to go … again, so I said she should not go, but she still went. I was angry with her. I often*

stop her from travelling… we quarrel often about that.' (Husband of Esi, Adabra, March 2002).

'*One day my husband told me not to travel, but I disobeyed him and travelled. When I came back he and some soldiers had gone to my land and destroyed all on my land. He went to the landowner to collect my money and told him not to give me the land again [land she had acquired to build a house]…..Any time I wanted to travel, I needed to seek permission…If he doesn't want me to go and I go, then he would lock the door and not let me in when I returned'* (Victoria, Abora, June 2002).

The in-depth interviews allowed us to analyse the prevailing pattern of gender relations in the villages, and to monitor any changes in gender relations in the villages associated with the introduction of the IMTs. They also provided much incidental information on a broad range of issues concerning village economies and the role of transport, mobility and access in shaping them. The interviews also illustrated the ways in which these factors shaped the lives of village men and women on a daily basis.

One of the most interesting perspectives which emerged during our discussions around IMTs was the perceived difference between men and women's strength and the way in which this affected the use of the push trucks. Although women carried extremely heavy loads, they were perceived by men (and perceived themselves) to lack strength to push the push trucks. As Grieco et al. (1996) point out, it is difficult to entangle practical difficulties from gender stereotyping.

'*Women have no strength for pushing the truck. They can help us in pushing it, but they cannot use it alone'*…. (Lome, male respondent, June 2002).

'*I cannot push the truck, so whenever the children are not in and I am in need of water, I fetch it [by headloading]*.' (Abora, Sister Aba Ackon, June 2002).

It is certainly very common to see trucks either being pushed by children alone, or with one man pulling at the front and the children (and possibly his wife or another adult woman) pushing behind. This has resulted in some changes in the tasks which women do: especially a reduction in water carrying (particularly in Abora village where the water has to be brought down from the new village site about a kilometer away).

'*When my husband uses the truck to fetch water for me, I get more water and I have more time to do other things. The water I get lasts longer…. If I tell him to fetch the water he will not go, but if he sees that there is no water in the house and he gets none [because the children are not around] then he hires the truck [at a cost of 500 cedis to the new site] and goes*.' (Sister Aba Ackon, Abora, June 2002).

The power tiller, in particular, has also made a substantial change in the firewood loads carried by many women in Abora (where collecting firewood for sale to fish smokers at Apam is a major source of income.) It has also resulted in a new development whereby men collect firewood and pass it on to the women to sell it for them.

'When the power tiller wasn't in I didn't sell firewood, but once it came I fetched firewood for the power tiller to convey. [Why not before?] From here to Apam is far and headloading of firewood is tiresome… previously women carried firewood to

Apam, but now because of the IMTs they convey much firewood from farm to the power tiller to convey for them.' (Kwesi, man of 25 years, Abora, June 2002)

Elsewhere, too, there were cases where men were using the truck to carry fuelwood for their family, where previously cultural conventions had prevented them from assisting even if they wished to do so:

'*A lot of work done by women I can do now, because I don't carry, but I can use the truck…..Now for the firewood I can convey it to the edge of the village with the truck, but because of our custom a man shouldn't carry firewood, but with the truck I can.*
(Paul Simpson, teacher, Lome, January 2002)

'*now he can just send the truck while I work in the house…. I go less to his farm now than previously. If he wanted to fetch firewood I needed to go with him, but now he can just use the truck and the children to fetch it.'* (Paul Simpson's wife, interviewed separately, March 2002).

'*Previously he was not helping me with the firewood, but now he helps with the pushing of the truck loaded with firewood.* ' (Aminatu, Lome, March 2002)

There has also been a reduction in the amount of heavy crops carried by women, though this is generally only the case where the fields are easily accessible from a track which can be negotiated by a push truck:

'*When I want to process gari I just hire the truck to convey cassava. [who operates it?] my brother… pushes for me… [The truck] reduces my headload and I don't feel pains from headloading again…. it has changed my time of headloading. … we also used it to convey our maize… we used the truck for the entire harvest'.* (Dora, Ewe woman, aged c. 30, Adabra, June 2002).

'[*The IMT] has reduced my time spent, because if I want to convey maybe 5 headloads, I can use the truck or power tiller once to convey all. If I have 10 headloads to be carried to the junction and the power tiller or truck is available, I can send my child to take it to the junction, so I have much time to rest.*
[what do you do with the saved time you now have?
I use it for other work. If somebody wants to buy something and I am not around the person will not buy from me. But since I have time to be around now in the house, I use it for selling.[Has your income changed?]The power tiller and truck have brought a difference to my income, because now I can convey about 20 headloads of firewood from the farm to the village because I know that the power tiller can convey it to the junction for me. But when the power tiller was not in, I could not convey all 20 headloads, because I wouldn't have been able to carry all the firewood to the junction at one time. (Aba Akon, Abora, January 2002)

Where farms are at some distance from the settlement, women sometimes benefit from the bicycles even though they do not ride them themselves:
'When we go to farm and I have much to headload, he at times puts part of it at the back of the bicycle for me to reduce my headload…..' (Faustina, Aworabo, June 2002)

'[*the bicycle] has changed how I visit the farm. When there is no food in the house, he [husband] will use the bicycle to farm to fetch it rather than me going to bring it. …My husband visits the farm early in the morning [with the cycle] and starts work early before I reach the farm. That has reduced the work I do at the farm…. Since he is using the bicycle he reaches the farm early and weeds much. So sometimes when I come I will not even weed but just gather….I have more time now and I use it to rest [she has recently given birth]. Previously when I told him to headload food for me he would not, but since the bicycle came… I can just tell him to go and pick it. Previously I could not tell him.'* (Comfort, Aworabo, June 2002).

Only a few women seem to have benefited in terms of their personal mobility from the IMTs. Faustina, cited above, was one of the very few women who expressed enthusiasm about the cycle in this respect:

'*During Sundays vehicles don't come here at all. When I want to travel to some place on Sunday I sit on the back of the bicycle while my husband rides…. So if both of us are going to that place I sit at the back*.' (Faustina, Aworabo, June 2002).

Very occasionally men and women alluded indirectly to positive changes the IMTs have brought to their personal relationship:

'*Previously when we had many loads to be conveyed to the house, he would never carry some to help me, so I was always angry with him, because I was expecting him to be supportive. But now because of the truck, such conflicts have stopped….we are pushing the truck together*.' (Aminatu, Lome, March 2002)

'He is now helping me more than previously… previously he wanted to help me, especially with the firewood, but he was unable to help. But since he is using the truck now, he feels happy that he can help…previously he felt angry when I told him to carry something to help, but new since he uses the truck he is not angry when I tell him to convey something for me. We quarrel less.' (Paul Simpson's wife, Lome, March 2002)

'*It [the push truck] helped my wife to reduce her headload. That was a change for me, because normally she complains of headache, but when she uses the truck, she did not complain again*.' (husband of Amma Sarah, Aworabo, June 2002)

However, most men and most women consistently argue that the IMTs have had no impact on relationships between men and women in the village:
'*Nothing has changed. Since we have children, he was not headloading before, and is also not pushing the truck, because of the children.'* (Adwoa Manang, Lome, March 2002). The most important change, they agree, has been in terms of children's activities.

5.4.6 Studies with porters

Almost all porters, men and women, were unconcerned about the presence of the IMTs and did not feel in competition with them for their work. This can be related to various factors:

- The widespread labour shortage in the region

- Porterage is only a part-time occupation in the villages: they are generally only hired in the harvest season. Most porters say that farming provides their main source of income.
- IMTs may not be cost-effective for carrying small loads – hiring charges vary but in some cases trucks are hired out at 5,000 – 10,000 cedis per day (2002), this is expensive when only one or two headloads need carrying.
- IMTs can only be used on certain paths: there remain many fields where porters are still required. Aunty Efia, for instance, a porter at Aworabo observed: *'those farms I have been working on [as a porter], the truck cannot go there. I don't have a specific farm, but the farms I have been working on, the truck cannot go. The farms are behind a stream.' (June 2001)*
- Many non-beneficiary farmers will not be able to afford or may not wish to hire an IMT unless, for example, they need to convey a crop quickly before it rains. Friends often help one another to headload and in this case no money changes hands. (IMT owners apparently tend to want payment in advance – perhaps 5,000 cedis for the day – whereas porters can often be hired on credit and paid later. In Sampa, for instance, women carry sand for masons and report they are sometimes not paid till the end of the year.)
- Some male porters have hired the trucks when contracted to carry heavy loads. For instance, Kojo Atta at Lome described how he had hired the truck when asked to carry wood (for building) for a village elder. Previously when carrying wood for this man he had headloaded it. He had to pay to hire the truck but '*it reduced the headload and it also saved time, because if I use my head, I go about 4 to 5 trips before I finish the job, but with the truck I only had to go once.' (June 2001).* He felt the benefits in terms of energy and time saved were worth the hiring cost.
- Male porters at Lome argued that the trucks would reduce women's headloading burden at harvest and would enable farmers (including women farmers) to increase their cultivated acreage.

5.4.7 IMT attitudes survey

This survey was a repeat of the survey conducted in January 2001. It took place in January 2002, exactly one year later and almost one year after the introduction of the project IMTs (with the exception of the power tillers which were delayed in shipment and did not arrive in the villages till May 2001). The following discussion draws attention to similarities and differences from the baseline attitudes survey. This sample was slightly smaller (150 in total, as opposed to 161 in 2001).

The IMTs which villagers would personally find most useful varied somewhat from the baseline. However, both surveys may have been skewed by the fact that some of those participating probably shaped their answers, particularly in this question, to their interest in obtaining an IMT if they did not own one already. Those who had obtained a particular IMT in the previous survey now, in some cases, logically indicated another preference as their first choice, since they already obtained their initial first choice in 2001.

It is thus difficult to interpret change in preference. However, it is clear that wheelbarrows are still of little interest. The specially designed handcart seems to have also gained little further interest, though in one of the two villages where it had been

adopted in 2001 (Aworabo) 4 people ranked this as their first choice. The conventional motorized vehicle has become of overwhelming interest across all the villages. It may well be that, having seen IMTs introduced in the project in 2001, respondents thought that the next round might offer some potential for acquiring a motorized vehicle on credit. Some decline in interest in push trucks and cycles was indicated between 2001 and 2002. This could well be due to perceptions that there would soon be sufficient in the village to satisfy requirements. The interest in power tillers was also still fairly high, and analysis by village showed interest to be strongest in Abora and Aworabo, the two villages where tillers had been purchased in 2001. This probably relates to the specific conditions prevalent in those two villages which encouraged adoption of tillers in the fist place (in Aworabo distance from the paved road and substantial cocoa production, in Abora the potential to carry fuelwood - a difficult load for conventional small vehicles - to Apam market.)

IMT/vehicle type	No. of times this IMT stated as first or joint first preference in 2001 (N=181, M=97, F=84)	Number of project IMT purchases in 2001	No. of times this IMT stated as first or joint first preference in 2002 (N= 153, M=77, F=76)*
Wheelbarrow	3 (3M, 0F)	7	5 (0M, 5F)
Handcart	16 (4M, 12F)	2	7 (2M, 5F)
Push –truck	37 (23M, 14F)	44	28 (9M, 19F)
Power tiller	41 (17M, 24F)	2	19 (13M, 6F)
Men's cycle	19 (16M, 3F)	16	9 (7M, 2F)
Women's cycle	16 (13M, 3F)	0	3 (2M, 1F)
Donkey cart	0 (0M, 0F)	0	0 (0M, 0F)
Car	49 (21M, 28F)	N.A.	82 (44M, 38F)

Comment [GD1]:

**There were only 150 respondents in this second survey (75 men and 75 women), but as in the baseline survey, a few gave tied first choices*.

Of the 150 respondents in the 2002 attitudes survey, just 19 (10.7% of men and 14.7% of women) had applied in 2000 for an IMT through the project. The baseline survey had included a rather higher proportion of IMT applicants (25% men and 18% women.)

This 2002 survey group, when asked why they had not made applications in 2000, responded fairly similarly to the baseline respondents, though the 2002 respondents included a larger proportion of people who had been absent at the time of the initial project workshop. Given the passage of time since those IMT applications were made, it is probably difficult to make more detailed assessment of the results.

Main reason for not making an IMT application to the project in 2000 (2001 baseline survey)

	Not present in village	Sickness	No money	No interest	Already owned by self/ family	Not eligible	Not able to operate by self	No work for IMT	No children to operate	Other/ mixed reasons
Male (N=59)	27.1%	5.1	18.6	0	5.1	1.7	1.7	0	0	20.3
Female (N=67)	25.4%	3.0	26.9	0	4.5	0	4.5	1.5	1.5	17.9

Main reason for not making an IMT application to the project in 2000 (2002 survey)

	Not present in village	**Sickness**	**No money**	**No interest**	**Already owned by self/ family**	**Not eligible**	**Not able to operate by self**	**No work for IMT**	**No children to operate**	**Other/ mixed reasons**
Male (N=75)	64.2%	1.5	9.0	6.0	6.0	1.5	0	0	0	11.9
Female (N=75)	46.9%	0	26.6	1.6	6.3	0	0	0	0	18.7

Respondent experience of using various items of equipment is expected to be higher in 2002 than in 2001, through loans and/or hiring arrangements, given the presence of project IMTs in the villages, despite the fact that most respondents had not themselves acquired an IMT. This indeed is clearly the case: actual numbers are higher in every category, despite the smaller total sample size in 2001, and percentages show a substantial increase in every category except the women's cycle (which was not selected for purchase by any villager through the project). However, in each IMT category there are still substantial proportions who have clearly not gained any access to that type of equipment. Two young men interviewed in Lome who worked sometimes as porters on construction sites had used the trucks very occasionally and acknowledged their value (emphasizing that they do not spoil there work opportunities), but emphasized the high charges made by owners:
'those having trucks do not allow us to use them…it is not free, they charge high. They charge 10,000 cedis for using it within the village. One boy used Mr T's truck to convey cassava and it rained and he couldn't sent the truck to the owner, so T said he should pay for keeping the truck with him until the next day…. We prefer using the truck but they charge too high, because if you are hired [as a porter] to convey things …. You will use some of the charge to pay for the truck'. (Two men, c. 25-30, Lome, June 2002).

While pushtrucks were adopted throughout the villages in the project, and at least one wheelbarrow and men's cycle is present in every village through project or other purchases, power tillers were selected for purchase in only two settlements, Abora and Aworabo. Examination of village patterns show that in Abora 96.7% and in Aworabo 86.7% of respondents had used a tiller at some time, elsewhere the figures were much lower (Lome 33%, Sampa 10%, Adabra 27%). It is important to note that when people talk about having had use of equipment, this may mean that it was used for their produce, not that they necessarily either operated the equipment or accompanied it.

Equipment type	**No. who have ever used in 2001 (N= 161, M=79, F=82)**	**% of total sample who have ever used in 2001**	**No. who have ever used in 2002 (N= 150, M=75, F=75)**	**% of total sample who have ever used in 2002**
Motor transport	160 (78M, 82F)	99.4%	150(M=75,F=75)	100%
Man's cycle	68 (55M, 13F)	42.2	94 (63M, 31F)	62.7
Women's cycle	10 (8M, 2F)	6.2	12 (11M, 1F)	8.0
Push truck	76 (48M, 28F)	47.5	92 (56M, 36F)	61.3
Power tiller	33 (18M, 15F)	20.5	76 (43M, 33F)	50.7
Wheelbarrow	63 (45M, 18F)	39.1	79 (58M, 21F)	52.7

Responses regarding the degree and nature of changes (positive and negative) associated with the IMT adoption may be particularly important when examining

project impact. In 2001 the questions asked focused around anticipated change, in 2002 respondents were asked what change had occurred.

	Big change	Medium change	Small change	No change	No response/don't know
Male 2001	82.3%	11.4	3.8	1.3	1.3
Male 2002	76.0	16.0	4.0	4.0	0
Female2001	68.3	13.4	3.4	0	15.9
Female2002	62.7	13.3	2.7	17.3	4.0

The table above indicates that men are rather less confident than they were a year previously about massive change occurring with IMTs, but their assessment overall is still very positive with 92% estimating that big or medium change had occurred. The majority of men (92%) and a rather smaller but still large majority (74.7%) of women in 2002 consider the impacts of IMTs had been positive (compared to 100% of men and 92.7% of women anticipating positive impact in 2001.) In 2002, 5.3 % of women thought impacts had been specifically negative (compared to 2.4% anticipating negative impacts in 2001). This suggests a very small amount of cooling in attitudes to IMTs. However, given that few of the survey group had as yet obtained IMTs through the project, it may be that they hope to do so, or possibly to obtain other benefits, and are thus unlikely to raise any concerns.

In terms of IMTs making life easier for women, some cooling of initial optimism regarding IMTs is evident, particularly among women respondents. Only 80% of men and 64% of women in 2002 felt they had changed life for women, compared to 97.5% of men and 100% of women anticipating change in the baseline survey. However, 100% of women and 98.8% of men indicate that, if there had been a change, it had been towards making life easier, not harder.

In terms of impact on men's lives, however, the optimism regarding IMT impact seems to have been very largely maintained among both men and women. 93% of men in 2002 felt there had been an impact on men's lives in the village (compared to 98.7% anticipating impact in 2001) and, if there had been an impact, 100% felt it had been positive (compared to 98.7% anticipating positive change in 2001). 98.2% of women in 2002 were confident that, if there had been an impact on men, it had been positive (compared to 97.4% anticipating postive impact on men in 2001).

Again, this data has to be examined with some caution, given that villagers who have not yet obtained anything through the project may not wish to sound negative, in case this bars them from other project loans. Rumours with absolutely no basis in fact, about possible opportunities, occasionally spread through the villages, despite all efforts of project staff to dispel them at an early stage! This is a fairly common problem for projects and researchers in Ghana.

Responses regarding impact of IMTs on production suggest that there has been a substantial change of attitude, however. In 2002 there is far less confidence that IMTs will change the quantity grown (though of those who believed a change in quantity had occurred, the direction of change is perceived as still wholly positive.)

Perceptions of impact on production

	Will/has change(d) quantity grow	Will/has not change(d) quantity grown	No response/don't know
Male 2001	94.9%	3.8	1.3
Male 2002	60.0	36.0	4.0
Female 2001	89.0	9.8	1.2
Female 2002	44.0	49.3	6.7

In 2002 women, in particular, were also less confident that firewood quantities collected had changed as a result of IMTs (64% of women thought change had occurred, compared to 95% anticipating change in 2001; 81% of men, compared to 97.5% in 2001). However (as anticipated in 2001), almost all women and men thought that any change had been towards an increase in quantities collected.

The question about whether respondents thought IMTs had changed the way they helped one another to carry produce from the farm to the village was answered as positively by men in 2002 (82.7%) as they had when anticipating change in 2001 (81%), but again, some cooling is evident among women in 2002 (69.3% felt they there had been change in the way they helped one another) compared to 2001 (when 85.4% anticipated change). Nonetheless, many women were still very positive. An Ewe woman at Adabra, for instance, described how the push truck she had hired at harvest had benefited her: '*previously, whenever we wanted to harvest maize, we harvested it bit by bit, because we cannot carry [it all] at once, but now because of the truck we can harvest in one go and organize the children to help in pushing. And there is no need to organize so many people as in previous years*.' Others, however, elaborated that the truck was only useful to owners.

There is a clear view among both men and women in 2002 that IMTs have changed the way they use conventional motorized transport (men 77.3%, women 73.3% in 2002, compared to anticipation among 59.5% of men and 58.5% of women in 2001), though there is slightly less confidence that the pattern of conventional transport services have changed because of the presence of IMTs (37.8% men and 32% women in 2002, compared to 40.5% men and 45.1% women anticipating change in conventional transport patterns due to IMTs in 2001.) On the other hand, road and path improvements as a result of IMT use are noted by more people: 48% men and 41% women in 2002, compared to 45% men and 33% women anticipating change in 2001.)

Again, it must be stressed that this data has to be examined with some caution, given that villagers who have not yet obtained anything through the project may not wish to sound negative, in case this bars them from other project loans. Rumours with absolutely no basis in fact, about possible opportunities, occasionally spread through the villages, despite all efforts of project staff to dispel them at an early stage! This is a fairly common problem for projects and researchers in Ghana.

Nonetheless, some broad tentative conclusions can be drawn from the statistics:

- There have been no massive changes in attitudes to IMT types or attitudes to potential/actual impact since the project IMTs were introduced.
- Over half the people in the villages have probably now had access to IMTs (though this may not mean they have operated them themselves).

- Despite the presence of the many project IMTs, a large number of villagers have probably still been unable to gain access (hire/loan) to use them.
- Men are still very confident about the positive impact of IMTs but women are rather less optimistic than they were in 2001, especially in terms of actual impact on women's work loads.
- The biggest change in views on impact relates to agricultural production. Fewer men and women estimate in 2002 that IMTs have led to an expansion in agricultural productivity than anticipated change in 2001 (though 44% women and 60% men consider there has been a positive impact.)
- The period under assessment (one year) is too small to fully assess attitudinal change to the IMT introductions. A review in four or five year's time could be more telling.

5.4.8 Traffic counts (September 2001, March 2002) and review of conventional transport

Data is displayed below for local market days and non-market days for each village, firstly in September 2001, then in March 2002.

Abora traffic count (market day at Apam) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Apam Junction	49	30	5	0	8	1*	0
Footpath to Apam	25	33	0	0	0	0	0
Footpath to Brofoyedur	15	43	0	0	0	0	0

* power tiller

Abora traffic count (non-market day) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Apam Junction	78	77	10	0	6	0	0
Footpath to Apam	9	5	1	0	0	0	0
Footpath to Brofoyedur	25	32	0	0	0	0	0

Sampa traffic count (market day at Kyiren Nkwanta) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Sampa Junction	73	79	2	0	34	0	0
Road to Akropong	235	258	3	0	7	0	0
Footpath to farms	179	186	0	0	4	0	0

Sampa traffic count (non-market day) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Sampa Junction	53	33	1	1	18	0	0
Road to Akropong	220	290	0	0	3	0	0
Footpath to farms	110	84	0	0	0	0	0

Adabra traffic count (market day at Kasoa) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Akoti	102	104	22	0	121	0	0
Road to Duafo	112	111	23	0	131	2*	0
Footpath to Kuma	74	90	21	0	4	2**	0
Footpath to farms	112	79	1	0	0	2***	0

* push-truck; 1 men and 2 children pushing; 3 children pushing
** push-truck; 6 children pushing; 10 children pushing
*** push-tuck; 1 men pushing; 1 men pushing

Adabra traffic count (non-market day) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Akoti	114	57	19	0	91	0	0
Road to Duafo	128	94	17	2	88	0	0
Footpath to Kuma	69	36	10	0	1	0	0
Footpath to farms	100	93	2	0	0	0	0

Lome traffic count (market day at Dawurampong) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Dawurampong	42	14	11	0	62	0	0
Road to Oguaa	130	102	5	0	4	0	0
Footpath to farms	95	115	0	0	0	0	0

Lome traffic count (non-market day) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Dawurampong	117	141	8	2	35	1*	0
Road to Oguaa	134	118	8	0	11	0	0
Footpath to farms	204	230	0	0	0	0	0

* Push-truck 2 men and 4 children pushing

Aworabo traffic count (market day) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Odumase	111	96	11	0	6	2*	0
Path to Nkukuasa	138	86	0	0	0	0	0
Footpath to Ayitey and farms	245	155	2	0	0	0	0

* power tiller

Aworabo traffic count (non-market day) SEPTEMBER 2001

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT Male	IMT Female
Road to Odumase	103	96	7	0	24	0	0
Path to Nkukuasa	89	51	0	0	0	0	0
Footpath to Ayitey and farms	125	171	4	0	0	0	0

Abora traffic count (market day at Apam) MARCH 2002

	Ped. Male	Ped Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT male	IMT female
Road to Apam Junction	45	41	13	0	25	0	0
Footpath to Apam	17	28	0	0	0	1*	0
Footpath to Brofoyedur	4	12	1	0	0	0	0

*1 power tiller

Abora traffic count (non-market day) MARCH 2002

	Ped Male	Ped. Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT male	IMT female
Road to Apam junction	84	165	6	0	8	6*	0
Footpath to Apam	3	4	0	0	0	0	0
Footpath to Brofoyedur	15	11	0	0	0	0	0

*4 power tiller; 2 wheelbarrow

Sampa traffic count (market day at Kyiren Nkwanta) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle Female	Motor vehicle	IMT male	IMT female
Road to Sampa (Brofo) junction	57	79	2	0	30	0	0
Road to Akropong	83	67	0	0	15	0	0
Footpath to farms (Okye river)	181	219	1	0	0	0	0

Sampa traffic count (non-market day) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle female	Motor vehicle	IMT male	IMT female
Road to Sampa (brofo) junction	40	82	0	0	4	0	0
Road to Akropong	184	239	0	0	0	0	0
Footpath to farms (Okye river)	202	319	0	0	3	0	0

Adabra traffic count (market day Kasoa) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle female	Motor vehicle	IMT male	IMT female
Road to Akoti	211	154	57	0	138	0	0
Road to Duafo	96	94	30	0	118	0	0
Footpath to farms	75	69	0	0	0	2*	0

* 2 trucks

Adabra traffic count (non-market day) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle female	Motor vehicle	IMT male	IMT female
Road to Akoti	139	175	21	1	89	0	0
Road to Duafo	153	177	115	0	71	0	0
Footpath to farms	73	48	0	0	0	0	0

Lome traffic count (market day at Dawurampong) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle female	Motor vehicle	IMT male	IMT female
Road to Dawurampong	58	30	7	0	60	0	0
Path to Oguaa	92	60	0	0	6	0	0
Footpath to farms	88	94	0	0	0	0	0

Lome traffic count (non-market day) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle female	Motor vehicle	IMT male	IMT female
Road to Dawurampong	136	94	6	0	31	0	0
Path to Oguaa	120	46	1	0	8	0	0
Footpath to farms	235	266	0	0	0	0	0

Aworabo traffic count (market day) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle female	Motor vehicle	IMT male	IMT female
Road to Odumase etc.	89	67	4	0	21	2*	0
Path to Nkukuasa	51	45	4	0	0	0	0
Footpath to Ayitey and farms	246	277	3	0	0	0	0

*2 power tiller

Aworabo traffic count (non-market day) MARCH 2002

	Ped. Male	Ped. Female	Bicycle Male	Bicycle female	Motor vehicle	IMT male	IMT female
Road to Odumase etc.	98	85	4	0	9	0	0
Path to Nkukuasa	80	54	1	0	0	0	0
Footpath to Ayitey and farms	216	271	2	0	0	3*	0

* 3 handcarts

The main conclusions from the September 2001 and March 2002 traffic counts (and comparison with that conducted in January 2001, prior to IMT distribution) and related data are as follows:

- Pedestrian traffic continues to dominate.
- There are still hardly any motor vehicles operating from the survey settlements, with the exception of Lome. Here road improvement seems to have encouraged the purchase of 3 tro-tros and one taxi which were based at the village in July 2002.
- Conventional motorised traffic on market routes, as in the baseline survey, depends on whether recent road grading has occurred.
- Motorised vehicles are equally common on non-market days at the height of the harvest season (September) but are more common on market days in the March count.
- Cycle traffic shows some increase, notably in Adabra.
- A small amount of IMT traffic (tillers, trucks, wheelbarrows) is now recorded, but with no significant difference between September (harvest) and March.

5.4.9 Operation of groups

Group operations are discussed in depth in Porter and Lyon (2003). Attitudes we found in our survey villages strongly contradict those reported by Anchirinah et al. from their survey of farming across the country's main agro-ecological zones (Journal of Sustainable Agriculture 2000, vol 17, 2-3: 145-168). They found that a majority (61%) of farmers 'preferred cooperative or some form of farmers' association, as opposed to individual, ownership and management of technologies'. Village groups extant in our study villages in 2002 were mostly no more vibrant than they had been in 2000.

The IMT and other groups in Abora, Sampa and Aworabo were observed and monitored with interest in 2000-2002. At Sampa there was an ADRA group (initiated by ADRA) of 25 people (the required size) which commenced operation during the course of our project, but it encountered many problems: '*we encounter conflicts at meetings… For example yesterday they had a meeting and they quarreled'*. (ADRA motivator, Sampa, March 2002.)

The Aworabo power tiller group was monitored by Frank Owusu Acheampong. This emerged out of a dormant farmers' group of about 25 men and women, which had been formed a few months earlier to try to obtain a bank loan. It was unsuccessful and thus dormant, but a few men who were members of the group saw the potential of the tiller and persuaded the 18 people in the group – all men - to join together to buy the tiller. Nonetheless, individuals among this group expressed concern about the viability of group enterprises in Aworabo in private conversations with Frank Acheampong. By the time the future operators were to be sent to Accra to train, when the tiller had arrived at the suppliers, only seven men remained in the group. By the day the tiller was delivered in the village, only four men were left in the group. One man only announced his withdrawal from the enterprise (giving no explanation) when the other group members went to call him to tell him the tiller had been delivered (and the first payment was thus due.) This left just three men in the group to take the tiller. Although the tiller has been used for a wide range of tasks and reportedly earns substantial amounts for the operators, only a very small portion of the total purchase cost has been repaid.

The Abora IMT group may have benefited from the fact that members were mostly related to one another. The formation of the women's group at Abora, as discussed in the following interview with Kathrin Blaufuss (January 2002), indicates the way thinking evolved in the village, following the failure of a previous (31st December women's movement group):

> *AA: when you brought the truck, I decided to join the group, because I thought if I am in need of anything, the group can help me. I am still happy being in the group, because I think it will help us a lot. We decided to make a farm together and we planted some crops, but the rains had failed us. But I am still happy with my decision.*
> *KB: did you receive any benefits from being in the group already?*
> *AA: we decided in the group that we would help the needy, but so far none in the group was in difficulties yet. So we didn't need it. I had no benefits from the group so far, because I had no difficulties for which the group could help. I strongly belief that this group will help us a lot. Since the 31st December group failed us, we have learnt a lesson and I know this group will not fail us.*
> *KB: what lesson did you learn?*

AA: that group has not totally collapsed, we collected some money from the members and we opened a savings account at the bank and we decided to use that money to help the needy. But when you were in need and had asked that group for some money they would not give it to you.. That's why many people had stopped joining that group, but for this women's group, we selected new Elders and they will not fail us. We voted for the Elders when we formed the women's group and we are only 9 people. We decided not to involve many people, because we wanted this group to be firm.
KB: how many Elders were selected?
AA: This is a women's group, but one man is among us. He and two women are the group elders.
KB: when the truck or power tiller conveys your produce, do you accompany it yourself?
AA: if I want to use the power tiller or truck, I either go with it or send one of my children to go with it.
(Abora women's group member, January 2002)

Other women in the group were also positive:

'we are only 7 people in the group, so we can understand one another…. There are no problems…. When we formed the 31st December group, there were many men in the group, but there was conflict between us, that's why we decided to form a women's group…. The men did not pay so we decided not to have them in this group.' (Essi, Abora, January 2002)

However, there is still much skepticism about groups, as Alice notes with reference to her husband's views:

KB: did you discuss with your husband that you wanted to join the group?
AA: I decided with him
KB: who brought up the idea?
AA: I decided it first. When I told him that I wanted to join the group, he disagreed with it, but I decided that I wanted to join.
KB: why did he disagree?
AA: they had formed a ADRA group and my husband was among, but then he travelled to Accra and spent 3 years there. So when ADRA brought some food for the group, they decided not to give me any, because they said my husband wasn't here. Later the group collapsed and we also formed the 31st December group, which also collapsed. So my husband had decided not to form any group again.
KB: how was it possible for you to join if the husband disagrees?
AA: he told me if I joined the group I can do so.
KB: since you joined the group, did you have any other discussions with him about it?
AA: I have not discussed anything with him concerning the group, but he has been asking me about the group.
KB: why?
AA: he wanted to know whether the group will last or collapse, but I have decided not to tell him anything about the group. When I told him I wanted to join the group, he disagreed, so I don't see why he should ask about the group again
KB: has that caused tension between you and your husband?
AA: there is no tension, since he has been asking me and I was not responding, he has stopped asking now.

KB: who makes the payments to the group for truck?
AA: I have been paying the debt from my own money and last time when we met at the meeting, they told us to pay some amount and I paid. I have only 20000 cedis left to pay.
KB: what does your husband think that you use your money for that purpose?
AA: he did not disagree with me.
(Alice, Abora, January 2002)

While Abora's power tiller group has failed dismally in its repayments (only 3.7%; similar to Aworabo's 6.78%), the women's group had totally repaid the cost of its push truck. The community groups at Sampa had each paid 150,000 of the 250,000 due.

We conclude as follows:

- Women's groups are likely to have more cohesion and exhibit greater collective responsibility than mixed or male groups in this region (mirroring widespread findings elsewhere in Africa and Asia).
- Group formation is a difficult issue even for women in most of the survey settlements.
- Abora women's group worked together effectively because the members were limited in number, were mostly related women and they had a strong leader, committed to the project.
- Group formation is probably particularly difficult in a transport context where maintenance and repair issues have to be addressed (see IMT review report, Porter 2003).

5.4.11 Load weighing

This section focuses first on actual loads, then on load carrying trips.

Maximum load size carried on specific routes in each village (in kgs), surveys June-July 2002

Village name F=farm day, M-=market day	**Women**	**Men**	**Girls (under 18) Age indicated if under 16**	**Boys (under 18) Age indicated if under 16**
Gomoa-Abora:				
Apam path F	40 kg	25 kg	6 kg (13 years)	18 kg
Ankamu road F	35	50	19 (15 years)	2 (14 years)
Brofoyedur F	48	22	20	19 (11 years)
Gomoa-Adabra				
Farm path F	40	50	19	21
Akoti junct. M	55	40	35	25
Gomoa-Lome:				
well path F	41	45	25	28
Nduam road F	58	43	31 (14 years)	30 (15 years)
Oguan road F	45	55	17 (11 years)	25 (14 years)
Lome Nduam M	44	39	19 (15 years)	35
Gomoa-Sampa:				
Okye river path F	45	45	18 (13 years)	20 (14 years)
Akropongjunc. F	62	65	25	20
Brofo junction M	31	20	19 (13 years)	25 (14 years)
Assin-Aworabo:				
Japan bridge F	31	48	20	25
Oda path F	39	45	12	20 (14 years)
Odumasi path M	41	33	19	15

Average load and total loads carried along specific routes in each village (in kgs), surveys June-July 2002 (no. of trips indicated in brackets: this table excludes all trips where only a cutlass is carried).

Village name	Women	Men	Girls (under 18 years)	Boys (under 18 years)
Gomoa-Abora:				
Brofoyedur F	11 (12 trps)=132 total loads carried	27 (6 trps)=162	19 (1trip)=19	0
Apam path M	21.6 (50 trips)=1083	8.75 (4 trips)=35	18.6 (3 trips)=56	12 (9 trips)=108
Gomoa-Adabra				
Farm path F	16.8 (50 trips)=839	17.1 (34 trps)=582	9.6 (8 trps)=77	5.4(21 trps)=116
Akoti junct. M	25.3 (25 trps)=632	15.4 (29 trps)=446	7.6 (15 trps)=114	8.9 (24 trps)=213
Gomoa-Lome:				
well path F	14.1(185trips)=2598	13.1(84trps)=1101	9.2 (72 trps)= 665	12.5 (59trips)=738
Nduam road F	13.9 (89 trps)=1235	18.4 (45 trps)=830	11.6 (17 trps)=197	13.2 (21 trps)=277
Oguan road F	15.4 (44trps)=676	11.8 (28trps)=332	9.4(7 trps)= 66	12.2 (17 trps)=208
Lome Nduam M	20.4 (8 trips)=163	16.3 (3 trips)=49	17 (2 trips)=34	22.8 (5 trips)=114
Gomoa-Sampa:				
Brofo junction M	11.7 (42 trps)=490	19 (32 trps)=608	7.46 (26 trps)=194	10.2 (12 trps)=122
Okye river path F	19.8 (62 trps)=1229	23.6 (33 trps)=778	11.5 (21 trps)=242	12.3(15 trps)=184
Brofo juntion M	9.9 (151 trips)=1502	8.25 (40 trps)=330	6.62 (21 trps)=139	13.2(12trps)=158
Assin-Aworabo:				
Japan bridge F	7.8 (62 trips)=487	13.5 (39 trps)=530	5.05 (35 trps)=177	4.7 (48 trips)=224
Oda path	11.5 (54 trips)=622	12.1 (29 trps)=352	6 (17 trips)=103	11 (5 trips)=55
Nkukusua path M	12.3 (33 trips)=405	9.5 (30 trips)=285	12 (2 trips)=24	8.5 (4 trips)=34

Number and percentage of head/cycle load trips on specific village routes, June -July 2002

Village name	Women	Men	Girls (under 18 years)	Boys (under 18 years)
Gomoa-Abora:				
Ankamu road F	28=34.1%	21=25.6%	14=17.1%	19=23.2%
Brofoyedur F	20=48.8%	17=41.5%	2=4.9%	2=4.9%
Apam path M	51=71.8%	8=11.3%	3=4.2%	9=12.7%
Gomoa-Adabra				
Farm path F	58=36.5%	71=44.6%	9=5.7%	21=13.2%
Akoti junct. M	25=21.9%	50=43.9%	15=13.2%	24=21%
Gomoa-Lome:				
well path F	201=40.2%	147=29.4%	78=15.6%	74=14.8%
Nduam road F	108=45%	77=32.1%	20=8.3%	35=14.6%
Oguan road F	59=31.9%	83=44.9%	13=7%	30=16.2%
Lome Nduam *M	8=27.8%	3=16.7%	2=11.1%	5=27.8%
Gomoa-Sampa:				
Brofo junction F	47=36.7%	41=326%	27=21.1%	13=10.2%
Okye river path F	71=34.1%	65=31.3%	23=11%	49=23.6%
Akropong Junc. F	161=46.3%	91=26.1%	51=14.7%	45=12.9%
Brofo Junct. M	28=32.2%	40=46%	4=4.6%	15=17.2%
Assin-Aworabo:				
Japan bridge F	67=26.4%	93=33.8%	43=15.6%	72=26.2%
Oda path F	67=27.5%	53=21.7%	45=18.4%	79=32.4%
Nkukuasa path M	33=33.7%	56=57.1%	2=2.1%	7=8.3%

* Many travel by tro-tro on market day from Lome when the road is in good condition.

This data as in the baseline study includes many people – particularly men and boys - who were only carrying cutlasses. They were on their way to and from the farm. If we were to exclude those who only carry cutlasses (which just weigh around 1 kg) from the

calculation, women's and girl's loads would substantially outweigh those of men and boys, respectively, especially along farm routes. An example is provided below:

	Women	**Men**	**Girls (under 18 years)**	**Boys (under 18 years)**
Sampa, Okye river data with cutlass	71=34.%	65=31.3%	23=11%	49=23.6%
Sampa, Okye river data excluding cutlasses.	62=47%	33=25%	21=16%	15=11%

The table below indicates the sum total of cycle loads included in the table above: whereas in 2000, three load carrying cycles were counted, in this exercise no load carrying cycles were encountered (and surprisingly only one push truck load). This suggests that despite the introduction of a number of new cycles in the villages under our IMT project, the concept of the cycle as principally a means of personal transport has been firmly retained, despite our efforts to demonstrate the potential of cycles as load carriers at the first village workshops and our subsequent discussions with cycle owners on this topic.

Village name	**No. of cycle loads counted**
Gomoa-Abora	0
Gomoa-Adabra	0
Gomoa-Lome	0
Gomoa-Sampa	0
Assin-Aworabo	0
Total	0

Conclusions can be drawn as follows:

- Massive head loads were occasionally recorded for men and women: maxima are even higher than in 2000. Project IMTs do not appear to have reduced maximum load size.
- This data includes many people – particularly men and boys - who were only carrying cutlasses on their way to/from farm. If we exclude these journeys from the calculation, women's and girl's total load carrying trips per day substantially outnumber those of men and boys, respectively, especially along farm routes, just as they did in 2000.
- Women's average load across all routes (15.1 kg) is almost exactly the same as for men (15.27) when cutlasses are excluded from the data. Girls under 18 averaged 10.75 kg and boys 9.96 kg. Females thus carry similar load weights to males, but undertake far more journeys per day.
- No load carrying cycles were encountered (and surprisingly only one push truck load). Despite the introduction of a number of new project cycles, the concept of the cycle as principally a means of personal transport has been firmly retained, despite our efforts to demonstrate the potential of cycles as load carriers at the first village workshops and our subsequent discussions with cycle owners on this topic.

5.4.10 Children and IMTs

We had not adequately appreciated the importance of child labour contributions in headloading nor their potential contribution to IMT operations until we undertook this study in R7575. Children are active members of the community and contribute largely to transport activities. After the project IMTs were introduced, many children were found to have used them for a variety of different purposes, including leisure. This prompted a range of investigations with teachers, and with school-going and non-school children and their parents.

Full conclusions are discussed in detail in Porter and Blaufuss (2003). Some of the principal points are as follows:

- Children are sent for errands or to transport various commodities. Hence, the children's perception of the newly introduced IMTs is important
- Households who took project IMTs were mostly those with child labour available to operate them: 'If you have children to operate it [push truck] it is easy to collect one, but if there is no child you cannot operate it.' (Old woman, Lome, January 2002)
- Children treat IMT operation as a game: '*it is very fantastic when you push', 'we enjoy it very much and push willingly', 'since the truck is there I find it easier to work on the farm', 'we were not enjoying the work at the farm, but now because of the truck we want to go there.'*(Group of boys, Lome, July 2001)
- We had not anticipated child operation and thus did not provide adequate safety training for children at the outset of the project. Some minor accidents occurred.

5.4.12 Safety and maintenance issues: the village bicycle workshops, school studies and final review of equipment condition

Safety and maintenance issues tend to receive limited attention in IMT studies, yet are crucial to the overall success of IMT introductions.

For example, needed to learn more about parental and child attitudes to safety to supplement our knowledge about children's role in rural transport, the significance of which became increasingly apparent over the project, since both headloading and much of the IMT operation is conducted by children. We had not provided adequate initial safety training for children on our IMT project, because we did not realize that children would become IMT operators for their families.

Maintenance and lack of budgeting for maintenance and essential repairs is a long standing problem in IMT projects (see IMT review) and this study confirms the difficulties of developing a maintenance culture, despite the maintenance training and tools provided for the power tiller by the supplier, the maintenance training and support provided for the tiller and the push trucks by MOFA AESD and Frank Owusu Acheampong, and the cycle maintenance training and tools provided through the village bicycle workshops organized by an NGO.

In-depth interviews with villagers illustrated the regularity with which equipment broke, due both to the lack of attention to maintenance and sometimes to use of the equipment for inappropriate tasks or, most commonly, through over-loading. Commonly, villagers would only repair the equipment when it was urgently needed for a task: consequently,

broken push trucks in particular were often abandoned until the next harvest season when funds would be available and the equipment in demand. The following quotations are typical:

'One of the tyres is loose [on her push truck]…. I cannot use it.'
[why didn't she repair it?]
'I have no money on me now and there is no work for it now. So I keep it for the harvesting period so that I can get money and repair it in order to use it during the next harvest.'
(truck owner, Efua Terbah, Lome, June 2002)

'If there is a fault and I want to use it, I send it to the vulcaniser. If there is a fault but I don't use the truck I just leave it until I need it. I could always use the truck if I wanted to.'
(truck owner, Teacher Nyarko. Lome, June 2002)

'*When it [push truck] got spoilt I thought you would repair it for us, so it was lying idle, but Frank [Owusu Acheampong] told me that I have to do it. So now I have taken it to repair to Oda'* (Amma Sarah, Aworabo, June 2002)

Most villagers did not budget for maintenance despite our recommendations (though Teacher Nyarko cited above was an exception). A typical response was:
'since it [the push truck] has not given me any problems, I have not thought of putting money aside' (truck owner, Mr Tani, Lome, June 2002)

As the following table shows, 25% of equipment was out of use by the end of the project due to poor maintenance, despite our best efforts to provide maintenance training and support. If we had failed to provide support, presumably that figure would have been much higher. It would be useful to review the condition of equipment say two years hence, after the withdrawal of project support.

Village name	**Equipment out of use, April 2003**	**Project equipment in use, (inside or outside the village) April 2003**
Gomoa-Abora	1 push truck	2 push trucks 1 power tiller (but damaged trailer) 1 hand cart
Gomoa-Adabra	2 push trucks 1 bicycle	10 push trucks 2 bicycles
Gomoa-Lome	2 push trucks 1 bicycle	11 push trucks
Gomoa-Sampa	1 push truck 1 wheelbarrow	4 push trucks (but 2 have loose tyres) 2 wheelbarrows
Assin-Aworabo	2 push trucks 6 bicycles	9 push trucks 1 power tiller 6 bicycles 1 handcart (but damaged stand and mesh) 4 wheelbarrows
Total	17 pieces of equipment out of use (=24%)	54 pieces of equipment in use (=76%)

- Safety and maintenance issues tend to receive limited attention in IMT studies, yet are crucial to the overall success of IMT introductions. All potential operators must be trained.
- Maintenance and lack of budgeting for maintenance and essential repairs is a long-standing problem in IMT projects (see IMT review). This study confirms the difficulties of developing a maintenance culture, despite the maintenance training and tools provided for the power tiller by the supplier, the maintenance training and support provided for the tiller and the push trucks by MOFA AESD and Frank Owusu Acheampong, and the cycle maintenance training and tools provided through the village bicycle workshops organized by an NGO. Project equipment broke frequently, due both to the lack of attention to maintenance and sometimes to use of the equipment for inappropriate tasks or, most commonly, through over-loading.
- Most villagers only repaired IMTs when urgently needed for a task: consequently, broken push trucks were often abandoned until the next harvest season when funds would be available and the equipment in demand. '*When it [push truck] got spoilt I thought you would repair it for us, so it was lying idle, but Frank [Owusu Acheampong] told me that I have to do it. So now I have taken it to repair to Oda*' (Amma Sarah, Aworabo, June 2002).
- 25% of equipment was out of use by the end of the project due to poor maintenance,
- Despite our best efforts to provide maintenance training and support. If we had failed to provide support, presumably that figure would have been much higher.
- It would be useful to review the condition of equipment say two years hence, after the withdrawal of project support.

5.4.13 Trafficability studies and road improvement interventions: socio-economic perspectives

Input by villagers on track improvements has been largely limited to labour inputs related to VIP-funded improvements (discussed below.) Villagers continue to weed the paths as they did before the IMTs arrived, but there is little evidence of any real village-initiated effort at track improvements, despite the fact that individuals related weeding after the IMT introductions to the IMT intervention:

'*It is because of the truck that we weeded [the path]*'. (Mr Tawiah, Adabra, January 2002.)

The one clear case where work was conducted on the paths occurred at Lome.

'*First it was only a path, but we made some adjustments so that thte truck could pass. We enlarged the path. I and some other people weeded the path. A lot of people have their farms there, so we do it as communal labour. Before the trucks in the village, we would just weed, but now we enlarge it and made adjustments to make it level with the hills which were there. After I used mine to my farm, they used my truck to their farms….The path was only a men's job*.' (Teacher Nyako, Lome, January 2002.)

The initial road studies in the baseline survey, conducted by Mr Anang Siaw of MOFA VIP Cape Coast, subsequently led to a decision by MOFA VIP to support our research on IMTs by upgrading two of the access routes in Gomoa district and one route in Assin district. These were routes where improvement was considered to have potential to substantially facilitate IMT use:

1. The direct track from Abora to Apam, which is heavily utilized by headloaders carrying firewood and pestels from Abora and nearby villages (notably Brofoyedur) to Apam market.
2. The Lome-Ahemakwa road (which links to the main Cape Coast road.)
3. The link road from Aworabo to the Japan bridge.

Subsequently, VIP took the decision to improve other tracks and minor roads in the vicinity of the survey villages to support our project:

4. The Abora-Brofoyedur track
5. Adabra- Kumakope track
6. Ada bra- Akwarkyir track
7. Lome- Omanmu track
8. Sampa-Ohua
9. Sampa-Akropong
10. Sampa-Okye river

Unfortunately, these VIP improvements took longer to implement than was originally forecast, in the Abora-Apam case due at least in part to political disagreements regarding the alignment of the improved track. The commencement of construction work on the track from Abora to Apam coincided with our final village workshops there in July 2002. Consequently, it was not possible to monitor the impact of the equipment operating on the improved access roads.

A final review of the roads earmarked for improvement by VIP, undertaken in April 2003, found the Apam track had been completed and was in regular use by the power tiller (and occasionally by conventional vehicles.) The construction of the Abora-Brofoyedur track is still in progress. Construction of the Adabra- Akyarkyir track has been held up by a land dispute (when contractors arrived at the village to commence work, some of the landowners along the track required compensation from government.) The Adabra-Kumakope track has been completed. The three Sampa tracks have been completed but there were disputes over location of one of the routes. The Lome tracks are not yet finished. The Assin-Aworabo to Japan Bridge track is now completed and used by taxis, but the quality is reportedly poor (insufficient culverts).

One important point about the VIP roads relates to use of local labour. Although there is substantial commitment in government, on paper, to using local contractors and labour-based technologies, these do not always materialize into village benefits. The Adabra–Kumakope route, for instance, employed labour-based technologies, but the contractor did not employ local people. In Sampa, the contractor employed some villagers, but most labour was brought in from outside. In Central Region the local contractors are often urban-based entrepreneurs and tend to bring in their own labour. One of the potential benefits of marrying an IMT project with labour-based road and track improvements, is the opportunity for villagers to purchase IMTs with their earnings from labouring on the road. Had this occurred in the case of the VIP road improvements, it is possible that repayment rates might have been rather better.

Two other road/track improvements took place in the study villages, separate from the VIP initiatives discussed above:

1. Grading and subsequent tarring of the Abora-Ankamu. This was a politically-motivated intervention, road improvements being implemented just prior to the 2000 elections. (The MP for the region was from Abora and had been widely criticized in the village for doing little to help her home village.) However, this improvement has brought little increase in vehicular traffic to the village. Transport charges remained the same after the grading and tarring, though vehicle operators contacted at the Ankamu junction are now more willing to travel into the village than before.

2. In 2001 a building contractor who had just moved into Lome to farm used his own grader to improve the track to his farm. This has had little impact in the village since it does not serve other farms.

To summarise the broad conclusions:

- Input by villagers on track improvements has been largely limited to labour inputs related to VIP-funded improvements.
- Villagers continue to weed the paths as they did before the IMTs arrived, but there is little evidence of village-initiated effort at track improvements. Only one clear case occurred where work was conducted on the paths because of IMTs. '*First it was only a path, but we made some adjustments so that the truck could pass. We enlarged the path… and made adjustments to make it level with the hills which were there. After I used mine to my farm, they used my truck to their farms….The path was only a men's job.'* (Teacher Nyako, Lome, January 2002.)
- The initial road studies in the baseline survey, conducted by Mr Anang Siaw of MOFA VIP Cape Coast, led to a decision by MOFA VIP to support our research by upgrading 10 selected access routes with potential to substantially facilitate IMT use. Unfortunately, these improvements were not started until the IMT monitoring was completed.
- A final review of the roads earmarked for improvement by VIP (April 2003), found the Apam track had been completed and was in regular use by the power tiller (and occasionally by conventional vehicles.) Some others were still under construction.
- Although there is substantial commitment in government on paper to using local contractors and labour-based technologies, these do not always materialize into village benefits. The Adabra–Kumakope route, for instance, employed labour-based technologies, but the contractor did not employ local people. In Sampa, the contractor employed some villagers, but most labour was brought in from outside. In Central Region the local contractors are often urban-based entrepreneurs and tend to bring in their own labour.
- One of the potential benefits of marrying an IMT project with labour-based road and track improvements, is the opportunity for villagers to purchase IMTs with their earnings from labouring on the road. Had this occurred in the case of the VIP road improvements, it is possible that repayment rates might have been rather better.

5.4.14 Credit repayment: arrangements and repayment rates

Our initial approach had been to pay local banks to collect repayments from the communities because we wished to keep our research clearly separate from monetary transactions (which could affect our access to monitoring information). However, this proved highly unsatisfactory. The bank staff, though paid their travel expenses to the villages generally failed to appear on the agreed dates and two staff members at the Dewurampong bank who dealt with our project were subsequently dismissed following a Bank of Ghana audit. A decision was taken to leave our project accounts at the banks, but to remove full responsibility for credit repayment collection to an NGO. Three NGOs were invited to submit a proposal.

The NGO CRAN were specifically appointed in July 2002 to undertake full responsibility for credit collection from the villages, following the completion of the monitoring period and the planned absence of the Ghana coordinator, Frank Owusu Acheampong, who was scheduled to be based in UK from October 2002 to January 2003 to work on analysis of project data and write up his Masters thesis. CRAN was selected because of its experience and focus on micro-credit and the fact that it had an

office relatively close to the study districts in Cape Coast. Few NGOs operate in Central Region so the choice was, in any case, very limited. SelfHelp Foundation, which had worked with VIP were reluctant to undertake operations so far from their Kumasi base.

The required monthly collection in the villages by CRAN has proved extremely unsatisfactory. This is possibly attributable in part to earlier failures by the rural banks, but is also due to CRAN's failure to visit any villages, after Frank Owusu Acheampong's initial visits to the villages with CRAN in August 2002 (prior to his departure for UK), until January 2003 (when they visited the Gomoa villages). The visits made in January 2003 probably only occurred because of enquiries regarding their failure to present a report due in December 2002.

CRAN has blamed its failure on staff changes, staff shortages and the distance from their office in Cape Coast, but these explanations seem wholly unsatisfactory given the fact that CRAN agreed to take on the task and was due to receive payment on all travel expenses incurred in conjunction with the project. The gap in repayment collection unfortunately coincided with the absence of the Ghana project coordinator, Frank Owusu Acheampong, who was working on data analysis in UK from October 2002 to January 2003 and was further delayed by illness in UK until March 2003. His continuing illness prevented any visit to the field until April 2003.

Although the village collectors have continued their work, the failure of CRAN to visit the villages to collect funds and monitor progress, as agreed, has resulted in extremely low repayment rates overall. These are especially poor in the case of the two power tillers. The repayment rates are particularly low at Assin-Aworabo since it transpires that CRAN has not visited the village since August 2002.

Village	**IMT actual and % repayment by August 2002**	**IMT actual and % repayment by April 2003**	**Total number of IMT owners who have repaid in full**
Lome	1,244,000 (20.46%)	1,864,000 (30.66%)	1 (woman)
Adabra	3,288,000 (49.13%)	3,457,000 (52.62%)	5 (all women)
Sampa	1,055,000 (36.38	1,169,000 (40.31%)	
Abora	517,000 (34.65%)	773,000 (40%)	1 (women's group)
Assin-A	4,487,000 (39.59%)	4,489,000 (39.6%)	8 (7 men, 1 woman)

Total repayment for all IMTs: 20,598,000 = 23.48%
Total repayment for power tillers: 6,100,000=10.33%
Total repayment for IMTs excluding power tillers: 14,498,000=50.53%

Thus, in April 2003, of the grand total of 87,730,000 cedis due for repayment on IMT purchase, 671,320,000 remains outstanding. However, of the 20,598,000 paid to the village collectors only 12, 932,898 is recorded as deposited at the two banks where the project accounts are still held (7,085,148 at Assin Fosu ADB, 5,847,750 at Dewurampong rural bank.) This is partly due to the failure of the Lome collector to pay in 480,000 cedis (apparently loaned to his sick brother when the CRAN collector failed to appear). There are additional discrepancies between collectors and IMT owners in Adabra and Aworabo which have not yet been resolved satisfactorily.

At a meeting with Tim Donaldson and Ben Dadzie in July 2002, it was agreed that we would review CRAN's performance at the end of the project and, if satisfactory, pass

the subsequent administration of the revolving fund (for equipment under £500) over to them. Given the likelihood of substantial outstanding debts on the power tillers, transfer of this equipment to our MOFA AESD collaborators could be requested, for final decisions on their part regarding repossession. Discussion with Mr Boamah (June 2003) indicated these decisions would need to be taken in consultation with the District Chief Executives.

To summarise:

- Many villagers in this region are suspicious of susu, hence the decision to use rural banks.
- Credit repayment arrangements with the two local banks proved unsatisfactory and contributed to low repayment.
- VIP staff suggested the banks failed to take our project seriously because it was too small.
- Rural banks lack capacity and need substantial support: this point is accepted by VIP (see VIP operation manual for private goods activities, August 2002.)
- Credit arrangements with CRAN have been similarly unsatisfactory and further contributed to low repayment. CRAN is reportedly one of 8 NGOs to prequalify with VIP for their main phase: Mr Oppong and Mrs Gavor have been informed of our difficulties with CRAN.
- NGOs can play a valuable role in micro-finance in areas where they are well established. Central Region has received little attention from donors which focus on northern Ghana: hence the lack of NGO capacity in the region. This is likely to impact on any future credit-related projects in the Region.

5.4.15 The end of project workshops

Five village workshops and a regional workshop were held at the end of the monitoring phase.

5.4.15.1 The village workshops, July 2002.

The five individual village workshops provided a useful forum in which to review villager perspectives at the end of the monitoring period. In each village we invited IMT project beneficiaries, control group members, chiefs and elders, and various other villagers who had shown some interest in the project.

The village workshops followed a common format:

1. Frank Owusu Acheampong reviewed project objectives and explained why we were holding the workshop, emphasizing the importance of their experience and the advice they could provide to the Government of Ghana about IMT projects.
2. We then split the participants into two groups: one of women, one of men (in each case aiming to sit the beneficiaries separately from the control group to make note taking of responses easier).
3. We asked each group to discuss the impact that the various types of IMT had had upon them and upon the village.
   [Where necessary we prompted on the following issues: a) agriculture - farm size, food crops grown, cash crops, crop quantities marketed (strategies, costs, profits), impacts other than IMTs; b) labour/time budgets - communal labour inputs, changes in gender responsibilities and gender relations, children's labour, impact on porters, gender/age input into IMT operations; c) road/path widening- 'ownership' questions, disputes, damage to paths; d) impact of IMTs on conventional motorized transport; e) group Versus individual ownership; f) IMT

types selected; review of beneficiary orginal choice and current preference; g) who benefits most (individuals and type)? who loses out? negative impacts of IMTs?.]

4. Ranking of a wish list of possible future developments the villagers would like to see (school, more IMTs, paved road, electricity, improved water etc.- we had a series of pre-prepared pictures for pairwise ranking by the groups) – emphasizing that our project was not going to bring these.
5. After a short reporting back session we asked about repayment: how the beneficiaries hoped to clear their debts, what should be done about non-payers, and whether there was stilldemand for more IMTs.
6. We presented our conclusions about our work in this village and comparison with other study villages.
7. What happens next: we explained that we would be handing over to an NGO which would take over the repayment collections, and that a second round of IMTs with preference to control group members would depend on repayment.
8. We presented a photograph album to the village with copies of photos we had taken there during the project research.
9. Presentations of cutlasses were made to those beneficiaries who had paid for their IMT in full.
10. Individual invitations to the main regional workshop were given to selected beneficiary and control group members, elders etc. (We selected those who we thought would be confident enough to speak out at the workshop.)

Village responses at the workshops concerning overall project IMT impact are tabulated below:

	Lome women	**Lome men**	**Adabra women**	**Adabra men**	**Sampa women**	**Sampa men**	**Abora women**	**Abora men**	**Aworabo women**	**Aworabo men**
Farm size	*	*	**	**	0	0	*	0	***	**
Cropping patterns	0	*	0	0	0	0	0	*	**	*
Marketing Patterns	** (in village)	0	0	0	0	0	*** (fuel wood)	**	*** (fuel wood)	0
Farm labour savings	*	*	**	*	0	0	0	_	**	**
Communal labour savings	*	**	**	**	*	*	0	*	*	*
Gender relations	0	0	0	0	0	0	0	0	*	0
Environmental impacts	0	0	0	0	0	0	0	0	0	0
Physical barriers to IMT use (as perceived by villagers)	*	*	0	0	***	***	*	*	**	**

* = small/individual positive impact; ** = medium positive impact,
*** = widespread positive impact, - = small negative impact

Other points arising from the end of project village workshops:

Lome

- The requests for data during the farm survey had persuaded four farmers that self recording of their inputs, production and sales could be useful for getting a better idea of profitable enterprises.
- The push trucks are widely used to carry produce from the owner's house to the lorry park.
- The road improvements were the considered the most important change that had occurred in the village in the last few years by both women and men: 'we all agree that both the road and IMTs are good, but the road should come first' (male elder,men's group).
- Push trucks were considered the most useful of the IMTs by both women and men, but the women saw it more as a seasonal help only.
- All but one thought individual ownership of IMTs was essential (as opposed to group ownership.)
- Everyone agreed that it is children – mainly boys - who do most of the work with the push trucks. Why not girls?: 'girls should be working at the kitchen', girls are not as strong as boys' (male beneficiaries).
- There had been no land disputes associated with road widening.
- Everyone in the village has reportedly benefited from the IMTs and road grading, though the beneficiaries most of all. All the control group say they wish they had applied to purchase IMTs at the original workshop. Women thought the gari processors had also benefited a lot.
- The men's 'wishlist' of development goods: 1. hospital, 2. paved road, 3. credit, 4. electricity, 5. water, 6. toilets, 7. non-agricultural 'work', 8. market, 9. school, 10. IMTs, 11. motor vehicle, 12. cornmill, 13. church.
- The women's 'wishlist': 1. tarred road, 2. water, 3. electricity, 4. loans, 5. toilets, 6. clinic, 7. non-agricultural work, 8. school, 9. market, 10. vehicles, 11. cornmill, 12. IMTs, 13. church, 14. roofing sheets.
- Their great need now, they say, is more roads to the farms.
- A bicycle hire shop has now opened in Lome with 4 adult cycles and one child's cycle. It has been opened for a few months and is run by the kiosk owner, in conjunction with his grocery business. 4 cycles have been purchased within about 7 weeks prior to this village workshop. They are mostly hired by boys of 16-22 years of age at 200 cedis per 3 minutes and are mostly used for learning to cycle or for fun.

Adabra

- The most important change in the village over the last few years is considered to be the school building and the IMTs.
- The main impact of IMTs is said to be on farm area cultivated and to a lesser extent on communal labour tasks. 2 women and 9 men (6 are owners) say they have made bigger farms because of the push truck. One woman reckoned she had doubled the size of her farm. *'Its just the push truck that did it, no other factor, we used to have to carry everything, it was very difficult.'* The IMTs are not used for crop marketing at all: '*I cannot push it to Akoti, so we need a car'.* (Woman push truck owner).
- Both owners and control say they save time because of the push trucks.

- Crops for home consumption are still headloaded by women. The IMTs are only used to carry cash crops.
- Women help their husbands to push the push trucks.
- The majority of work operating the push trucks is done by boys. Men argued that the children have more time to play now, rather than less, because they head load less.
- No one is in favour of group IMT ownership. Men said that groups cause 'disputes, trouble and misunderstanding'.
- Beneficiaries are still happy with their IMT choice.
- Control group members all wish they had taken an IMT at the initial workshop.
- Women say they have benefited more than men from the IMTs, not necessarily because of earning money but because they carry less now (including farm products and firewood.)
- Women say the paths now have to be weeded less because the trucks keep the weeds from growing up.
- Women's 'wish list': 1. hospital, 2. paved road, 3. car, 4. light, 5. credit, 6. non-agricultural work, 7. piped water, 8. market, 9. church, 10. grinder.
- Men's 'wish list': 1. car, 2. loan/credit, 3. clinic, 4. paved road, 5. market, 6. non-agricultural work, 7. toilets, 8. IMTs, 9. water, 10. electricity.

Sampa

- The push trucks are said to be too heavy to push here because of the hills: they are used mainly in the village for local construction etc.
- IMTs have had no impact on farm size, time budgets or marketing whatsoever, according to the few women who came to the workshop.
- The community wheelbarrows are used by men, not women. They are used for community road mending and construction projects and other construction work. One man had once used the wheelbarrow for transporting citrus seedlings, but the distance (c. 3.5 kms) was too far.
- The push trucks are operated only by boys and men.
- The push truck is considered by men too heavy and too 'complex' for women to operate and 'the women are afraid because there are no brakes'.
- The wheelbarrow is operated by men not boys. (Boys do not do communal labour).
- Men say women have never asked to use the community wheelbarrow: 'women don't have the skills [to use it] and don't have time to learn.
- Men are roughly split re benefits of individual versus community ownership.
- Some owners regret that they bought pushtrucks and wheelbarrows. One said (incorrectly, at least so far as our project staff were concerned) '*we were given the assurance our farm tracks would be improved*.' Another said they would have liked to use the IMTs but the roads and tyres were bad. There is no regret, however, about the community wheelbarrows which are considered very useful.
- Women say they want motor transport because their goods get spoilt when they can not reach market.
- Women say that there is much migration in and out of this village.
- Men's 'wish list': 1. electricity, 2. hospital, 3. tarred road, 4. credit, 5. car, 6. non-agricultural work, 7. grinder, 8. school, 9. borehole, 10. toilets.
- Women's 'wish list': 1. loan (for farming), 2. car, 3. hospital, 4. road (to encourage regular vehicle transport), 5. electricity, 6. non-agricultural work, 7.

toilets, 8. piped water, 9. grinding mill, 10. school, 11. IMTs, 12. market, 13. church.

Abora

- IMT impact has had some impact on more crops grown: *'Previously I didn't grow cassava, garden eggs and okra…it is difficult to headload those products to Apam to sell. Now it's easy so that's why I've gone into those crops*.' (male tiller group member),
- IMTs have had some impact on farm size: '*generally people are doing a lot on their farms this year… because of the improved road and above all because of the IMTs which encouraged me myself to make a bigger farm this year…. I planted pepper, okro and garden eggs – in the past 3 years I've never grown these crops. IMTs motivated me, because no matter how big I make my farm, they are not going to get rotten at the farm*.' (Apam Chief) (Good price for pepper last year is another factor.)
- IMTs have also encouraged increased fuelwood extraction. Some were waiting till August when the fuelwood price at Apam would have risen, knowing they could use the tiller to take a large load at that time. In previous years they had had to take fuelwood to Apam over a long period because it had to be headloaded. (Others, however, needed to sell in small quantities anyway, in order to live.)
- Men are now collecting fuelwood at their farms, because they can send it by tiller to Apam for sale. (They couldn't be seen carrying firewood, so didn't collect it before.) There is such a demand for fuelwood there from the fish smokers that there is no difficulty in finding additional customers. Women also send firewood on the tiller.
- Water is a big problem in Abora. The IMTs have much improved access to water at the new site. It is carried by handcart, push truck and power tiller. Women do less water carrying now. '*Men also used to convey water, but women carried more because they have stronger legs and men have to do most of the farm work. Men just did one trip and women carried the rest.'* (elder).
- Children now do less work because they used to have to make 3 or 4 trips per day for water. Now they just go once or not at all.
- Young boys are the main hand cart and push truck operators. Some disagreement as to whether girls have ever helped push.
- Women sometimes operate the handcart themselves.
- Some beneficiaries are still happy with their choice of IMT. One truck owner wished he had purchased a cycle because once the tiller came he could not find enough work.
- Most men say women have benefited more than men from the IMTs.
- Some say they prefer individual to group ownership but it is recognized that if the equipment is costly group ownership may be the only way forward. But still concern that *'groups can collapse if group misunderstandings arise, [so then] the equipment falls out of use…we tried to make a group farm, when the day was fixed some couldn't go – there was no day so we never made the farm. We never met again when we couldn't meet on that day*.' (IMT owner).
- When the paved road to Ankamu was constructed no villager was employed on it. The labourers were reportedly mostly the contractor's own men from Cape Coast. If they needed unskilled people they used those from Ankamu not Abora

people. However, the contractor on the new Apam road had promised to use Abora people for building culverts.

- Some concern about the routing of the new road to Apam. The track was being diverted because of a land dispute at Apam which would extend the total journey distance. Equipment to make the road had just arrived, after two years' planning.
- The paved road from the junction to Abora is already starting to break up, but it has encouraged motorized transport: they now see at least 2 vehicles per day.
- Men's 'wish list': 1. non-agricultural work (Chief's initiative, others agree), 2. piped water, 3. cornmill, 4. school, 5. hospital, 6. credit, 7. church, 8/9. market/car, 10. toilets, 11. road, 12. IMTs, 13. electricity.

Assin-Aworabo

- Bicycles and power tillers have encouraged at least four men and nine women to increase their farm size at locations distant from the village: '*we are able to get to the farm quicker and work till late evening because we also know we can get home quicker'* (husband of cycle owner: i.e.cycle value as speedy personal travel, rather than as a load carrier.) '*The husband may go to the farm earlier on the bicycle and weed for you.*' (woman owner)
- Women say no other factor except IMTs has affected farm size. Noone beyond the river (where the IMTs couldn't reach) has made a bigger farm this year.
- Male teachers had used the bicycles to get to farm before and after school: *'because of the bicycle I could cultivate rice last year because I could get to the farm and then back to school.*'
- One woman said they wanted to learn to cycle on SMALL bicycles. 'They are too tall for us'. (A smaller women's cycle was on display at the workshop but women there said they preferred the man's cycle, Workshop Report, December 2000)
- The power tiller and push truck has helped farmers with farms close to broad tracks, especially at the cocoa harvest. One man (the power tiller operator) had used the tiller to cart his oil palm and citrus seedlings to start new farms.
- The tiller was used to convey women to market until the GPRTU stopped them. It is occasionally used to convey goods to market.
- Boys do more work with the tiller and push truck than either women or girls. Boys used to play foot ball after school. Now they help with the power tiller (women's group.)
- The cycles are mostly used by men but women benefit because men use them to bring small food quantities (e.g. cassava) from the fields for cooking.
- There is still plenty of work for porters because the cassava fields cannot be reached by IMTs.
- It is still necessary for cycle owners to travel to a major center to buy spare parts.
- A number of men who took push trucks say they wish they had selected cycles instead.
- All prefer individual to group ownership.
- Men have benefited more than women from the IMTs but no negative impacts of IMTs are perceived.

- Men's 'wish list': 1.paved road, 2. hospital, 3. electricity, 4. toilets, 5. non-agricultural work, 6. primary school, 7. credit, 8. car, 9. market, 10. grinder, 11. more IMTs (the control group wanted to put this higher but were shouted down), 12. water, 13. church.
- Women's wish list: 1. paved road, 2. clinic, 3. toilets, 4. non-agricultural work, 5. loan, 6. car, 7. electricity, 8. school, 9. piped water, 10. grinding mill, 11. IMTs, 12. market, 13. church.

5.4.15.2 The Regional Workshop, Apam, July 2002.

The workshop was attended by a wide range of participants: village IMT project beneficiaries, control group members, chiefs and elders; Gomoa and Assin District chief executives and their staff; Government staff from MOFA and Feeder Roads Department in Accra and the Cape Coast Regional Office; Dr Ben Dadzie (NR International); representatives from the World Bank and DFID (Engineering); NGOs (SelfHelp Foundation, Village Bicycle Project, CRAN); the rural banks; University of Ghana, Legon and University of Cape Coast. Dr Kaira and Dr Mutua respectively represented the linked Uganda and Kenya CPHP projects. Mr Bamba Thioye (from Senegal) represented IFRTD. The workshop was chaired by Mr Boamah (MOFA AESD).

Broad conclusions presented for discussion at the regional workshop by project staff included the data presented in the table above and broad conclusions from our monitoring studies as follows:

1. The role of children

- Availability of children to operate IMTs was a major factor influencing the decision to purchase (except in the case of the power tiller).
- Children undertake much IMT operation, just as they undertake much head loading.
- Children continue to enjoy operating the equipment, 16 months after its introduction and much prefer using it to headloading.
- There were initial accidents because we had not anticipated the need for safety warnings and training aimed at children
- The introduction of IMT work does not seem to have significantly altered patterns of school attendance.

2. The preference for push trucks

- Push trucks were the IMT most commonly purchased, probably for the following reasons:
  - familiar
  - fairly cheap
  - can be repaired locally
  - can be hired out in local markets
- Conventional transport is still used in preference to pushtrucks to take goods to market, because of the long distances involved.
- Push trucks are used for a wide range of carting activities:
  - agricultural produce (from house/barn to commercial vehicle loading points)
  - domestic water
  - firewood
  - local construction materials

- make-shift ambulances
- carrying corpses to the cemetery

- Push trucks were often probably purchased initially with a view to use outside the village in local markets. Unfortunately, our project monitoring requirements prevented this until the monitoring phase had ended.

3. The role of bicycles

- Women purchased men's bicyles (with cross-bar) even though women's cycles were available at the workshops.
- Women have commonly handed their cycle over to men and boys in the family.
- Cycles are used by men for personal travel and to access more distant farms. Some men say this increases time available for farming.
- Cycles are rarely used to take produce to market despite continued shortages of conventional motorised transport. The concept of the cycle as a load-carrying IMT has not been widely accepted. Cultural factors may have a stronger role than topography in inhibiting use for this purpose.
- Women and girls do not have time to learn to ride cycles. When girls are seen riding they are told they should be in the kitchen. Boys learn to ride after school at the time when girls are busy cooking.

4. Credit issues

- Our project initially enrolled two local banks to undertake credit repayment collection. As a research project, we did not wish to be involved in credit collection. This was unsuccessful, since the banks proved unable to provide the services they had offered. We had to replace this system by village collectors who take repayments to the bank.
- A reliable and effective credit system is probably essential for IMT promotion a) among poor women who most need access to IMTs, and b) in off-road areas where there are few salaried people, poverty is commonly much more widespread than in comparable paved road locations, and transport costs are often very high (fares along unpaved roads are roughly double per km those along paved roads.)
- Repayment systems are difficult to organise in off-road areas and probably need to be built on or run parallel to traditional susu systems, where these exist. However, in many Central Region villages there is little faith in susu.

5. Maintenance of IMTs

- There is no culture of maintenance in the villages. Most villagers have limited expertise in this field and most do not budget for regular IMT maintenance and repairs.
- Despite providing basic training on use of the IMTs, some equipment broke early on in the project and rapidly fell out of use. Project staff and our MOFA collaborators were called on to assist with obtaining parts and mending equipment. With the assistance of an NGO we recently held a bicycle maintenance workshop in 4 villages and village tool sets have been provided.
- Our experience suggests training about maintenance - and the need to budget for maintenance and repairs - has to come before equipment is acquired and needs to be very intensive. Village mechanics may expand in number, however, over time, particularly if more equipment is in use i.e. a critical mass is achieved.

These conclusions (which had been confirmed in the five final village workshops we held prior to the main regional workshop) were discussed by workshop participants.

The following further conclusions were reached by the regional workshop participants:

IMTs and agricultural production and marketing:

- Farmers testified that IMTs have benefited villagers because farm size has expanded and price of carting has been reduced. This supports the idea that IMT projects should be incorporated intensively in farm support programmes (credit needed).
- Need for education and promotion of IMTs, including tours to northern Ghana where use of bicycles is widespread.
- The need for improved tracks and trails. IMTs can cart to central points for onward movement by conventional transport in areas where access is poor.
- Since agro –ecological constraints have been removed (widespread land clearance having resulted in reduction of tse-tse infestation), education and promotion for animal traction is feasible. However, R7575 field staff argued from their intense interaction with villagers that the cultural constraints are unlikely to allow this.

IMTs and cultural issues

- IMT projects need to focus on both women and men
- Women should be encouraged to learn to cycle
- The importance of targeting youth re learning to cycle
- The importance of considering the role of child labour when designing projects

IMTs and credit/subsidy

- The need for responsible lending, looking at the economic activities of prospective beneficiaries.
- Project appraisal through site visits
- Formation of strong groups where appropriate. (R7575 field staff and some district staff argued that these may not always be appropriate.)
- Group lending schemes for high value items
- Clear credit criteria
- Part payment by beneficiaries prior to receiving the IMT
- Repayment incentives
- Credit must be accompanied by technical assistance
- Credit should be modelled on traditional savings schemes
- Repayment cycle should be based on the type of economic activities for which the IMT is being used
- Subsidies may be useful to facilitate the initial stages of IMT adoption

IMTs and technical issues

- Ideally, roads and paths should be improved prior to IMT adoption
- Beneficiaries need to identify main access routes for improvement
- Manufacturing of IMTs locally needs improvement/support
- Local IMT fabricators need training in the importance of using good quality materials and adherence to high standards in manufacture

- Brakes need to be made standard on push trucks
- Mechanics need to be trained to repair IMTs
- A range of IMTs should be available to potential beneficiaries

The role of researchers in future IMT promotion

- Researchers should be encouraged to intensify studies in the following fields:
    - IMT technologies
    - Credit management
    - Uses of IMTs
    - Transport infrastructure – roads etc.
    - Provision of baseline surveys
    - Needs assessment and SWOT analysis
- They should collaborate with NGOs to disseminate information

6. CONCLUSIONS: A REVIEW OF SOCIO-ECONOMIC PERSPECTIVES IN R7575

A careful prior assessment of socio-economic conditions and potential constraints on IMT adoption is vital when considering IMT initiatives, but it is not enough. R7575 illustrates the value of detailed monitoring while a project is in progress. It allowed us to follow through issues pertaining to a range of socio-economic issues and to identify further elements of IMT adoption which our prior assessment had not suggested.

In particular, R7575 monitoring drew attention to the significance of familiarity and critical mass for IMT acceptance, the special needs of child IMT operators, and the crucial importance of finding and implementing satisfactory credit systems, particularly when the focus is on settlements where access is very poor. It also emphasized the importance of developing a maintenance culture and providing training on maintenance (including the vital importance of budgeting for maintenance) prior to the implementation of an IMT project. R7575 clearly illustrated the difficulties of gender targeting. Despite our efforts to focus assistance to women, many women were simply unable to afford the equipment and some equipment apparently purchased by women – particularly the cycle - was used mostly by their menfolk. Overall assessments of impact of R7575 in the sample survey (of mostly non-beneficiaries) towards the end of the monitoring period in 2002 suggest that men are perceived to have benefited more than women from project IMTs. (Interviews with individual beneficiaries were somewhat more positive and at Adabra village workshop, women said they had benefited more than men.) Nonetheless, the IMTs have been used for a very diverse range of activities, both productive and non-productive, and their overall impact is judged by both beneficiary and non-beneficiary women and men as positive.

These findings have relevance for the many IMT projects planned or in progress in Ghana (including the IMT component of the main phase of the Village Infrastructure Project) and elsewhere in sub-Saharan Africa.

The following recommendations regarding IMT interventions in Africa are made on the basis of findings in R7575, coupled with a full review of the published and grey literature on IMTs, transport, gender and mobility/access issues in sub-Saharan Africa. They were presented in a preliminary form in the IMT review paper (Porter 2003).

- There may be a need to think more broadly about the potential range of IMTs and accessories made available in IMT schemes, including locally developed equipment which is already available in-country. Ghana's locally produced push-trucks are a case in point. (However, locally manufactured items may not be appropriate if cost is too high and quality control is inadequate. Where equipment is made from scrap, as in the case of the Kumasi push truck, there may also be problems around rapid production and sustainability when large amounts of equipment are required for a scheme.)
- An integrated approach is highly advantageous, combining simple road/path improvements with IMT promotion. This is likely to be particularly important where appropriate IMTs have more than 2 wheels. If the associated road/path improvement is labour-based and utilises local labour, this may enable local purchase of IMTs. In R7575, unfortunately the track improvements (by MOFA

VIP) were delayed and this reduced the utility of project IMTs during our monitoring phase. Moreover, it is important to monitor local contractors use of local labour when labour-based road works are implemented (in R7575 study villages, labour was reportedly brought in from outside by contractors).

- The Ghana Department of Feeder Roads does not have the capacity to maintain vast numbers of upgraded paths and tracks: similar conditions prevail elsewhere in sub-Saharan Africa. The continuation of local ownership will need to be emphasised when tracks are upgraded in conjunction with IMT schemes. In southern Ghana there is a tendency among villagers to assume that government work on local routes constitutes a change of ownership and that, henceforth, government will undertake all maintenance and repairs.
- Careful *genuinely participatory* research into local preferences and conditions is essential (Cooke and Kothari 2001), prior to large-scale IMT introductions: technological solutions imposed by outsiders are very likely to fail. It is important to take into account the diversity of potential IMT users: their age, sex, income, occupations, the work they do at different times of year, ethnic group, religion and education (Starkey 2001: 21). This cannot be rushed. Careful 'fitting' of IMT type to the characteristics and requirements of the user, further bearing in mind the specificities of the local context, will then be required. Local solutions have to be found for local problems.
- Additionally, as R7575 has emphasized, monitoring of IMT projects in progress is crucial, both to inform that project, and to inform future initiatives. There is particular need for full, seasonal, Monitoring and Evaluation of IMT introductions over the next few years in Africa, in order to further build our understanding of both successes and failures: uptake, sales and use patterns and associated impacts; impact on agricultural production; marketed output; incomes; gender relations (including women's control over household resources); reallocation of any time savings; women's and children's health and educational access i.e. productive and so-called 'non-productive' uses. Assessment of impacts on non-owners, including those who make a significant portion of their income from head porterage, will also be important. Impacts on conventional transport services should also be assessed.
- Monitoring and evaluation exercises need to include longer-term assessments of project impact: there is a tendency to review projects only within the life of the project. (Longer term assessments will be particularly important with reference to environmental impacts.) Comparisons of pre-project attitudinal surveys with actual user uptake both within the project life and post-project could be particularly valuable. We found some divergence between views expressed in R7149 and actual uptake patterns in R7575, particularly with reference to handcarts and bicycles. We anticipate that much could be learned from reviewing the impact that IMTs have had in R7575 study villages in three to five years time.
- Disadvantaged groups of all kinds - women, the elderly, disabled and children - should be taken fully into consideration when planning and implementing transport interventions, including IMT schemes. Much information is now emerging about women's mobility needs and constraints: more studies are also needed about the specific requirements of the elderly, the disabled and children. It is important that such disadvantaged groups are treated as decision-makers, rather than merely as welfare objects.
- R7575 found no increase in gender tensions due to IMT introductions. Improvements in women's long-distance mobility may lead to increased gender tensions and in R7575 it emerged that arguments over women's (unnotified)

absences from the home village were often a major cause of household arguments: men tend to associate such absences with promiscuity. However, IMT introductions are unlikely to contribute to tensions over women's personal mobility since they mostly aid mobility over short distances. Moreover, in the case of the push trucks – the most popular IMT in R7575 – the truck aids load movement rather than personal mobility (and operation is mostly, in any case, by children and men.) The bicycle was the IMT introduction most likely to improve personal mobility but has been little used by women (see IMT report, Porter 2003, for discussion of women and cycling.) Involving men in interventions aimed at assisting women is likely to be crucial in order to avoid increasing gender tensions. In R7575 men did not feel excluded from the project and some men used their access to IMTs to take over tasks which their wives had previously had to perform, because of cultural prescriptions around men not carrying firewood, for instance. In the short term, at least, this seems to have benefitted some women. [The value of involving men is also exemplified by the situation in Kajiado, Kenya where men resisted women's adoption of new practices of using donkeys to carry firewood and water until they were involved in a visit to see the impact of this intervention elsewhere (Leyland 1996).]

- In R7575 access to child labour emerged as a crucial factor in IMT uptake in many households. Detailed examination of headloading also emphasised the role that children play as porters. Child contributions to portering (and to IMT operation where this occurs) is likely to be a widespread phenomenon in sub-Saharan Africa. The impact of these activities on children's health and education need careful examination. Their role as porters is certainly inadequately recognised in the literature which tends to subsume children's work under women's labour.
- Gender sensitisation and sensitisation to the requirements of other disadvantaged groups – notably children - is needed by transport planners: training in this field should be an integral part of professional training programmes.
- It is important to analyse intra-household dynamics around the control of household income, ownership and control of means of transport, disaggregation of transport demand and latent transport demand among household members when considering IMT interventions. Status issues and gender relations, in particular, may complicate the adoption and use of IMTs in the short term, even when specific cultural constraints appear to be absent. In R7575 although women purchased cycles through the project, it soon emerged that they were used by menfolk and (mostly male) children, because most women had neither the time nor the inclination to learn to cycle. Girls seen learning to ride cycles were admonished by other villagers - they were told they should be busy cooking in the kitchen - whereas boys were able to learn to cycle after school.
- Specific training programmes are needed to allow and encourage girls and women to ride and maintain cycles, and to drive and maintain motorised equipment such as motorbikes and power tillers. Public education programmes - particularly those targeting teenage schoolchildren - could probably do much to challenge prevailing inhibitions and restrictions. Cultural factors are difficult to change but not immutable.
- Women's access to credit is crucial if IMT adoption is to be widespread among women users. Even very simple low-cost equipment is often beyond the resources of women unless credit is made available. Repayment scheduling needs to be designed to accommodate women's income patterns. Terms needed to be clearly stated.

- Improvements to informal credit organisation are probably more viable in the short term for improving credit access for most women than looking to greater assistance from formal institutions. Training is needed for women so that they can run informal credit schemes without (the common current) recourse to male treasurers. Another possibility may be to look to ways of promoting commercial credit for women (given that women's payment record is commonly much better than that of men.) However, credit is a complex issue: much closer consultation with both poor women and poor men is needed in order to devise workable strategies for supporting IMT purchases.
- Promotion of IMT use among women could be encouraged through major women's organisations: e.g. in Ghana the Christian Mothers Association (a membership organisations well established across rural Ghana). Use of IMTs by local leaders and staff of such organisations could boost IMT visibility and acceptability among women.
- The recently established Ministry of Women and Children's Affairs in Ghana (and ministries with a similar remit elsewhere in sub-Saharan Africa) could aid IMT promotion among women and children if there is ample sensitisation to mobility and access issues.
- There are remarkably few women professionals in transport: more women need to be encouraged to specialise in this field. Consultation of women by women could represent an important step towards improved transport planning in Ghana, as elsewhere.
- Given the perceived difficulties of group purchase in terms of use and maintenance of equipment, there is need for further research around ways of building trust for effective group formation. Church groups often appear to have more sustainability than other types of group, but there may be equity issues around church groups. In some cases (like the Central Region villages in R7575), however, there seems to be such resistance to group enterprise that it will be important to find ways of providing access to equipment for individuals.
- Hire centres based at cycle/push truck shops could have an important role to play in circumventing cost constraints on IMT purchase among very poor populations and in situations where group activities are unlikely to succeed. Pilot projects (run by government or NGOs) which establish and initially fund hiring centres (similar to those developed in India) may be valuable.
- If IMTs are introduced in areas where they are likely to increase pressure on environmental resources (as, for example, in the case of expanded fuelwood extraction in Gomoa-Abora), accompanying environmental management projects and training are advisable. This will require collaboration with government departments and agencies such as the Environmental Protection Agency, the Forestry department and environmental NGOs.
- There is an urgent need for a more co-ordinated approach to transport and within that to IMT work. This applies to work by ministries (notably agriculture and transport) and NGOs. The exchange of information across ministries and NGOs - including information about problems and potential problems, rather than merely about successes - at planning, inception and Monitoring and Evaluation stages could be enormously beneficial. Joint programmes between the agriculture and transport ministries (e.g. combining credit access for transport IMTs with agricultural machinery) could similarly aid progress towards successful rural development. In R7575 push trucks, in particular, have helped some farmers with adequate access to expand agricultural production.

- Synergies between different groups promoting IMTs within a country (e.g.Ghana's VIP and RTTP) need to be encouraged for improved IMT promotion. In Ghana this will require improved linkages between MOFA VIP and the Department of Feeder Roads.
- NGOs need to become more involved in transport/access issues and IMT promotion. Most NGOs are based in locations along paved roads and very few NGOs in Ghana have expertise in the transport field. This might be addressed partially through the provision of short University-based training courses in participatory transport planning which include a practical field component.
- The local institutional context is also crucial. The potential enabling or disabling role of district administrations needs to be recognised and district administrative staff sensitised to the potential benefits of IMTs. They could have an important role to play in encouraging and supporting IMT introductions (if staff are able to perceive IMTs as more than mere revenue generators through licensing requirements).
- Transport Trade Union policy toward IMTs and their operators needs to be clarified. There may be need for a union for IMT operators. A formal consultation with the major transport unions is likely to be essential. In Assin-Aworabo, introduction of passenger services to a local market by the power tiller group, was effectively opposed and stopped by the local GPRTU, despite the fact that conventional taxi services are entirely inadequate and that, for the brief period it operated, this was a popular village service. The GPRTU objection was upheld by the local District Assembly because of the passenger insurance issue (see IMT review paper).
- Many Government staff at all levels in southern Ghana, as elsewhere in Africa, continue to display negative perceptions of IMTs as (backward) technology for backward areas. Regular circulation of IMT promotional material and specific loans for IMT purchase could be beneficial in improving the status of IMTs and promoting acceptability among this group. Extended provision of IMTs to men and women government staff in the agricultural, health and education services (accompanied by adequate training on operation and maintenance) could do much to raising the status of IMTs and supporting the development of critical mass, while also improving welfare, particularly in terms of improved services to remoter locations.
- Government rules on the licensing of IMTs need clarification, particularly with respect to power tillers. Rules and regulations relating to use of IMTs on public roads need to be reviewed.
- Taxation of IMTs also needs review. Current VAT on bicycle spare parts, on trailers for power tillers and on motorbikes probably discourages IMT expansion in Ghana.
- Safety issues are widely underestimated in an IMT context. Schools might have a substantial role to play in raising awareness of dangers and teaching children about road safety for cyclists. In R7575 children were found to play a central role in IMT push truck operation: careful monitoring of IMT use in the early stages of a project will ensure that safety training is directed towards the correct audience: i.e. to operators, not simply to owners. Insurance for IMT owners is a related issue which has not been adequately addressed.
- Maintenance is a major problem, because of the lack of a culture of maintenance. Again, schools could play an important role in teaching about cycle maintenance and the importance of budgeting for maintenance and repair costs. Broader vocational training courses in schools and colleges focused on IMT repair and maintenance could help capacity building for IMTs substantially. Tool kits and

maintenance training need to be made available whenever equipment is provided under an IMT scheme.

- Equipment needs to be simple and robust enough to allow cheap home maintenance: in the case of cycles, for instance, basic models without gears are probably currently the best choice in rural Ghana.
- The development of local capacity for manufacture and distribution of accessories such as sturdy cycle panniers (similar to the panniers which have recently been reportedly imported from Nepal into Ghana), simple luggage racks and child seats for cycles could be a very useful complementary measure, if supported by careful prior market research and subsequent market promotion.
- Animal traction programmes are unlikely to be successful in areas where there is no tradition of animal husbandry, unless the programme is committed to very substantial investments in training and support over a long period.
- A detailed review of IMT developments in countries where IMTs are relatively common - notably Nigeria (re the dramatic expansion of motorbike taxi services across the country) and Burkina Faso (re the marketing and promotion of a range of IMTs) - could help to identify lessons for IMT promotion in Ghana and other sub-Saharan countries. The potential for supporting development of bicycle and motorbike taxi services in areas with insufficient demand to support conventional motor services would appear particularly worthy of exploration.
- So-called 'spontaneous' adoption in conducive local circumstances seems far more successful in leading to widespread diffusion than IMT promotional projects, which tend to be small-scale and stay small-scale in impact (perhaps because of lack of critical mass etc.). The diffusion of motorcycle okada/achaba services in Nigeria provides a prime example of a highly successful spontaneous IMT innovation. We need detailed studies of these 'spontaneous' developments in order to understand the critical factors which sparked adoption.
- IT Transport (1996:6) propose (and other literature supports the view) that the most formidable challenge in designing an IMT intervention is to introduce an IMT which is completely unfamiliar. Given the limited funds and support available for IMT programmes in Ghana and elsewhere in Africa, it is probably wiser to avoid such equipment in the short-term. In R7575 we tried to introduce a handcart which village women had previously seen in photographs and thought potentially very useful. However, when confronted with a range of IMT options, uptake of the new handcart was very low: the locally-made push truck, though much heavier and less manoeverable was purchased in preference, because women were familiar with it from visits to local market centres.
- The Ghana National Forum for Rural Transport and Development was inaugurated in September 2001. [The group's founder members were R7575's Consultative Group: its members include MOFA VIP and Feeder Roads Department (which runs RTTP in Ghana).] The NFG should aid the development of a more co-ordinated approach to IMT development in Ghana. However, it will need continued support both from within Ghana and through the International Forum for Rural Transport and Development if it is to have any sustained impact.
- The potential of non-transport interventions and conventional transport interventions should be considered in conjunction with and as alternatives to IMT introductions. In particular, non-transport interventions can form an important complementary intervention to IMTs, where funding is available. In some cases they may usefully substitute for IMT interventions. In Abora village, for instance, one of the major benefits of the IMT introductions (though by no means the sole benefit) has been

improved access to water. The location of a water point at the village itself would make many journeys currently undertaken with the push truck, hand cart or tiller unnecessary.

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APPENDICES

Appendix 1: Maps of the survey area

Appendix 2: IMT Purchase agreement

Appendix 3: List of R7575 publications and interim reports

Reference Type	Citation Details
Book chapter	LYON, F. and PORTER, G. (2003, in press) The social relations of economic life and networks of civic engagement: social capital and targeted development in West Africa. In: *West African Worlds: local and regional paths through development, modernity and globalisation.* Cline-Cole, R. and Robson, E. (Eds.). Pearson Education, London, UK. (A) 14 pp.
MA thesis	OWUSU ACHEAMPONG, F. (2003, in preparation) The impact of transport interventions on agriculture in rural Ghana: a case study from Gomoa, Central Region. (Thesis in progress: was due for completion Feb. 02 but delayed by illness of Mr Acheampong, completion date delayed to October 2003).
Journal paper	BLAUFUSS, K and N. CHAPPELL (2003, in preparation) Environmental issues in IMT adoption.
Oral presentation and paper	PORTER G. and F. LYON (2003) Groups as a means or an end? Building social capital for targeted development in Ghana. Paper presented at the Association of American Geographers annual conference, New Orleans, 5-8 March 2003. 20 pp.
Paper	PORTER, G. (2003) Spatio-temporal perspectives on the social benefits and costs of roads and road transport: a discussion paper with special reference to women and children. Paper presented at the TRL Workshop on Framework for the inclusion of social benefits in transport planning, Bracknell, UK, 21-22 March 2003. 17 pp.
Internal report	OWUSU ACHEAMPONG, F. (2003) Report on one week field work trip. April 2003. 11pp.
Project report	PORTER, G (2003) Intermediate Means of Transport: an extended review paper with special reference to Ghana. April 2003. (Extended and fully revised version of initial IMT review paper prepared January 2001). 124 pp.
Oral presentation (power point)	PORTER, G (2003) Moving on? Towards a new agenda for women's transport studies in sub-Saharan Africa. Development Studies Association (Women and Development) meeting, University of York, 10 May 2003.
Journal paper	PORTER, G. (2003) Improving mobility and access for the off-road rural poor through Intermediate Means of Transport. *World Transport Policy and Practice (A*) 19 pp.
Journal paper	PORTER G. (2002) Living in a walking world: rural mobility and social equity issues in sub-Saharan Africa. *World Development* **30** (2): 285-300.
BTOR	BLAUFUSS, K. (2002) RA Field Report K 5: Report on the visits to Ghana June/July 2002, Department of Anthropology, University of Durham, 7 pp.
Report	PORTER G. (2002) Intermediate means of transport: a review paper with special reference to coastal Ghana. 90pp.
Oral presentation and paper	PORTER, G. and BLAUFUSS, K. (2002) Children, transport and traffic in southern Ghana. Paper presented at the international workshop on children and traffic, Copenhagen, May 2-3, 2002. 23 pp.
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